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Signs of Revived Demand Appear

Buying Movement in Pig Iron and Slight Gain in Inquiry for Steel Suggest Turning Point Is Near—Rate of Ingot Production Is Maintained—Imports in April Are High

DEVELOPMENTS in the past few days have crystallized the belief that the low point in iron and steel market activity either has been reached or is near at hand. Pig iron buying has been resumed on an encouraging basis and while the revival of demand for finished steel is not pronounced, the volume and character of inquiries have produced an unmistakable improvement in sentiment.

In spite of the fact most mills and furnaces are operating on what practically amounts to a jobbing basis, the rate of production is holding its own. The slight loss in ingot capacity reported in the Youngstown district is more than balanced by slight gains in Pittsburgh and Chicago steelworks. The average rate of steelmaking for the industry still is in excess of 60 per cent of capacity.

Price Trend Studied

The heavy buying of pig iron generally is interpreted as an indication that large consumers believe the bottom has been reached in pig iron prices. That this feeling also is shared in the finished steel market is evidenced by the resistance to further cutting reflected in current transactions. While shading is being done on some finished products, the tendency among many producers is to adhere more closely to the established prices. In the case of a number of mills it is doubtful whether outstanding low quotations will continue in force much longer.

Requirements for railroad bridges and construction work mark an otherwise inactive structural steel market. Inquiries for 1300 tons for a bridge for the Central of New Jersey railroad and 1000 tons for a Chesapeake & Ohio bridge are before fabricators. An award of 3800 tons for a building for a Chicago printing company has been made. An Illinois builder has received a contract for 220 cars for the Florida East Coast railroad. It is evident that car awards for May will fall considerably below the record of April. The Bethlehem Steel Co. has booked 50,000 boxes of tin plate for the Nippon Oil Co. of Japan.

IRON TRADE REVIEW composite of 14 leading iron and steel products this week again reflects the further concessions in the prices of pig iron, the figure being $41.14 as compared with $41.22 last week. The average for May is $41.38, which is in sharp contrast with the $47.52 level recorded in the corresponding month a year ago.

Iron Buying Resumed

Iron buying has been resumed on a large scale, transactions during the past few days totaling well over 100,000 tons. The American Radiator Co. is reported to have purchased 60,000 tons, the United States Cast Iron Pipe Co. bought 25,000 tons, the American Brake Shoe & Foundry Co. 7000 tons and the Ingersoll-Rand Co. 4800 tons. Smaller sales mount up to a fair tonnage. The volume of inquiry is encouraging, numerous consumers being in the market for lots ranging from several hundred up to 5000 tons. This buying has been attended by a further softening in iron prices. The range for Buffalo iron now is $19.50 to $20. and reductions of 50 cents have been made in quotations in some of the other markets. Most of the week's purchases have involved foundry iron, but inquiry on steelmaking grades has appeared in several markets. Consumers' stocks are low. In Buffalo only 11 blast furnaces are active. This is the lowest rate of operations in that district since the depression in 1922.

Interest in wages is centered on the negotiations with the Amalgamated Association of Iron, Steel and Tin Workers, which has demanded advances averaging 25 per cent, and on the Connellsville coke region where wage reductions amounting to from 20 to 33 1/3 per cent put in effect by two cokemakers undoubtedly will be adopted by other producers between now and July 1.

Import More Steel

Imports of iron and steel products into the United States in April amounted to 50,9[illegible] tons, the highest monthly tonnage recorded since July, 1923. Exports in April totaled 134,627 tons as compared with 120,596 tons in March, 1924, and 179,159 tons in April, 1923. The sale of European products to American consumers continues, the French correspondent of IRON TRADE REVIEW reporting that the Pont-a-Mousson works has disposed of 3000 tons of cast iron pipe to a New Jersey public service corporation. Several thousand tons of hematite iron has been sold to American buyers.

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Convention Season in Full Progress

EIGHT conventions of interest in the metalworking industries are reported in this issue of Iron Trade Review. This indicates the broadening scope of associational activities, and how thoroughly this publication responds to the needs of its readers for information concerning them. Staff correspondents

A group from one of the eight conventions held in the past week

attend the conventions, and in some instances a number of editorial representatives are in attendance. A point to be emphasized in this connection is that the work of these correspondents is not merely to present a volume of written material in which the reader has difficulty in finding the really new and interesting developments. The length of a convention report is never the true criterion of its value; it is how well the subject matter has been studied and put in readable form. This point should appeal to many busy readers.

Do You Know That—

There are 607 manufacturers of wire products, 931 manufacturers of sheet metal products, and 1296 stamping and drawing departments among subscribers to IRON TRADE REVIEW. Quite a market for punches and dies, presses and sheet metal working machinery!

Radiator Companies Reported To Have Bought 60,000 Tons of Pig Iron--Pipe Maker Places 25,000 Tons

PITTSBURGH, May 27.—Activity in the eastern pig iron market is not reflected here. Interest is restricted to a few 500-ton inquiries. The Ohio Steel Foundry, Lima, wants 500 tons of basic. The Pressed Steel Car Co. bought a similar tonnage, including 300 tons of a valley producer claiming to receive slightly above $20, valley, on low silicon specification. Another valley producer still is quoting $20.50, valley. A Johnstown, Pa., interest is quoting $20, having the same freight rate to Pittsburgh and common points as from the valley. A middle interest is naming $20, valley. Resale iron is understood to be available slightly under that basis. Bessemer is selling in carload lots at $22, valley. One fair size inquiry is current. The buyer expects a lower figure. The Pittsburgh Valve, Foundry & Construction Co. is scheduled to purchase 300 tons of No. 2 iron and 200 tons of No. 2X iron tomorrow. Current sales of foundry iron are in small lots at $20.50 to $21, valley, usual quotations. It is understood a middle interest is quoting lower than that minimum on resale iron. Low phosphorus copper free iron is wanted in small quantities. Several inquiries are current. A price of $29, valley, is quoted.

Sales Are Larger

New York, May 27.—It is estimated that sales of pig iron in this general territory during the past week aggregated 15,000 tons. The largest buyer was the Ingersoll-Rand Co., which is credited with having taken 4800 tons for the third quarter. A Newark, N. J., melter bought around 1000 tons of foundry and malleable. In addition, numerous smaller tonnages were closed. One of the sizable sales during the past week included delivery over the entire last half. On eastern Pennsylvania foundry the market now may be quoted at $21 to $21.50, base, at the nearest furnace with occasional compensation, on attractive tonnages, for freight rate disadvantages. On Buffalo foundry the market is $19.50 to $2 and not much attention is being paid to silicon differentials. Actual inquiry now before the trade involves at least 12,000 tons, of which the largest single inquiry calls for 4800 tons of foundry iron for the third quarter. A number of impromptu consumers may come into the market shortly.

The American Brake Shoe & Foundry Co. has bought 7000 tons of iron at Buffalo, and it is reported the American Radiator Co. purchased 60,000 tons, mainly Buffalo iron.

Sales Are Larger

Philadelphia, May 27.—The United States Cast Iron Pipe Co. in the past week bought a total of at least 25,000 tons of foundry iron, made up of purchases in the East, Middle West and South. Several other purchases by consumers in this district are reported including 500 to 1000-ton lots. The principal inquiry pending is for 5000 tons for the Worthington Pump & Machinery Corp. There are 20 other inquiries in the New York and Philadelphia territories, making a substantial total. On some recent business $20, eastern furnace, was done and it is reported that this figure was shaded. The present disposition is to regard $21 base as the minimum, but more will be known after the market is further tested. Several hundred tons of copper bearing low-phosphorus iron was sold in the past week. Prices are unchanged. Some feelers are out for basic iron. The Colonial Iron Co. blew out its blast furnace at Riddlesburg, Pa., May 26 for overhauling.

Buffalo Range $19.50 to $20

Buffalo, May 27.—Pig iron prices are not quite as firm as they were a week ago, but reduced operation and some fairly large sales may have a strengthening effect on the market, especially as one maker is 50 cents above the market on practically all grades. The range for No. 2 plain foundry iron (1.75-2.25 silicon) is $19.50 to $20. One furnace will not shade the latter quotation on any tonnage and no cutting of the former is reported from any source. No. 2X, the next higher silicon grade, can be had in more than average size lots within the range of the lower silicon grade, although the tendency is to quote $20 on this grade. No. 1X is quoted at $20.50. Basic and malleable command the same price range as foundry. Total inquiry is between 12,000 and 15,000 tons. Larger individual inquiries include one of 800, one of 1500 and one of more than 5000 tons. Local furnaces sold about 12,000 tons of iron last week. Operation has been reduced to 11 furnaces, with a like number out of blast. This is the lowest production in this district since the slump of 1922.

Buyers More Receptive

Cleveland, May 27.—Pig iron buyers are in a more receptive mood and sellers are confident that considerable business will develop in June. While consumers' stocks are very low, prices have settled to attractive levels, affording a better basis for negotiations. In the main, transactions still are restricted to small or moderate size tonnages, the largest reported as closed involving 2000 and 3000 tons. Inquiry is picking up, and includes some lots of 5000 tons. Recent experience has been that the inquiries of such size result in the closing of a much smaller tonnage, or none at all. The week's sales of pig iron by those represented in the northern Ohio group with headquarters here total close to 15,000 tons. One maker has inquiries pending for 12,000 tons. A Cleveland maker has booked one lot of 2000 tons for delivery in nearby territory. In some cases freight differentials are being absorbed yielding very low prices at furnaces. Competition in outside territory is being met by local furnaces. A Cleveland interest has reduced its quotation to $22.50, furnace, for delivery in the 50-cent switching area, while another still quotes $23, furnace, and has booked some medium size lots at this price. The lake furnace price elsewhere is held at $21. Some low phosphorus iron has been sold for delivery in this district at $29, valley. The market for basic iron is quiet.

Better Sentiment at Chicago

Chicago, May 27.—Sentiment is much improved in the pig iron market, and sellers are confident a turn has come. Spot inquiry is increasing and some melters are beginning to buy ahead. Sellers feel that the price of $22.50, furnace, probably is at the bottom. They believe melters who have stretched first quarter iron this far are bound to buy and that spot sales at least are certain to increase greatly. A Milwaukee melter is inquiring for 500 tons of foundry iron. Several Chicago melters are seeking 200 tons. One

seller reports several inquiries for as high as 1000 tons for the last half. Southern sellers are much more pessimistic than northerners. Plenty of southern iron is available at $21, Birmingham. Charcoal iron producers are trying to hold to $26, furnace, through the quarter.

Buying Slightest in Decade

St. Louis, May 27.—While slightly more interest in third quarter pig iron requirements is evidenced by recent inquiry, ordering for that delivery is the lightest for this time of year in more than a decade. All classes of melters are postponing purchases. Reserve stocks at some mills and foundries are at the lowest levels ever reached. The regularity and size of current shipments from producing points continue large, indicating the melt is fairly well sustained. Should this situation continue, sellers believe a brisk buying movement is inevitable during the next few weeks. Inquiry for third quarter totals approximately 4200 tons. The leading local producer has sold 700 tons to an Illinois stove maker which covers the latter's needs for third quarter. While quotations remain unchanged, concessions under the current range have been granted by northern and souther iron was sold at northern and southern producers. A round $23.16, delivered to a local foundry, which figures back to $21, Chicago. Southern iron is quoted at $21 to $22, Birmingham, but the rail and water rate brings the higher figure of the range on tonnage delivered here. The leading local producer quotes $23 to $23.50, f. o. b. Granite City, but is meeting competition from other producing points.

Buying is Weakening

Birmingham, Ala., May 26.—The home melt is not holding the pace that was noted a short time since. Soil pipe and fittings manufacturers, foundries and machines shops and other industries are not receiving new business in quantity, and operations are lagging. Others continue buying as needs appear, despite the fact that quotations are lower. The range is $21 to $22 and no difficulty is experienced in getting the first named price. The movement of iron from the Sloss-Sheffield Steel & Iron Co. furnaces at Sheffield, on the Tennessee river, where freight differentials permit of competition in the Middle West or Chicago and St. Louis territories, has not shown signs of abatement. Futher reduction of foundry iron on furnace yards is noted while basic shows an increase. The Gulf States Steel Co. has three out of six open-hearth furnaces in operation but the finishing department is less active.

Sales Still Small

Cincinnati, May 27.—The pig iron market still is stagnant. The outstanding transaction of the week was the sale of a tonnage of northern iron to the Monitor Furnace Co., Cincinnati, at $21, Ironton.

A leading seller reports the sale of 500 tons of southern iron to a Toledo, O., melter, while a sale of several hundred tons of charcoal iron to a northern Ohio consumer also is noted. The Hamilton Foundry & Machine Co. purchased 400 tons of iron from a Toledo furnace. Northern iron is quoted $21 to $22, furnace. The Louisville & Nashville railroad wants a limited tonnage of northern. The foundries in this district are operating at somewhat lower rates, in many cases, than two or three months ago, but on the whole consumption of foundry iron is at a good rate. The southern Ohio market is unchanged at $22 to $22.50, Ironton, but on an attractive lot it is possible these prices could be shaded. Southern iron is quoted at $21 to $22, Birmingham, the former quotation applying to the product of the Tennessee furnaces.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	May 28, 1924	Apr., 1924	Feb., 1924	May, 1923
PIG IRON				
Bessemer, valley del., Pitts....	$23.76	24.61	25.01	32.07
Basic, valley	20.00	21.70	22.00	29.80
Basic, eastern del., eastern Pa..	20.75	21.35	22.50	30.75
*No. 2 foundry, del. Pitts....	22.26	23.51	24.76	31.97
No. 2 foundry, Chicago	22.50	24.40	24.40	32.50
*Southern No. 2, Birmingham..	21.50	22.20	23.00	27.00
*Southern Ohio, No. 2, Ironton.	22.50	23.00	24.00	31.00
**No. 2X, Virginia furnace	25.50	25.50	25.75	28.60
**No. 2X eastern, del. Phila....	22.13	23.73	24.26	32.76
Malleable, valley	20.50	22.20	23.00	30.20
Malleable, Chicago	22.50	24.40	24.40	32.50
Lake Superior charcoal, Chicago	29.04	29.04	29.04	36.65
Gray forge, val., del. Pittsburgh	23.26	23.51	24.61	31.17
Ferromanganese, del., Pitts.	112.29	112.29	112.29	129.79
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	40.00	42.10	42.50	45.40
Sheet bars, open-hearth, Pitts....	40.00	42.10	42.50	45.40
Billets, bessemer, Pittsburgh....	38.00	40.00	40.00	45.00
Billets, open-hearth, Pittsburgh..	38.00	40.00	40.00	45.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.25	2.30	2.40	2.40
Steel bars, Chicago	2.35	2.41	2.50	2.50
Steel bars, Philadelphia	2.57	2.57	2.72	2.77

	May 28, 1924	Apr., 1924	Feb., 1924	May, 1923
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.47	2.47	2.57	2.82
Iron bars, Chicago mills	2.25	2.36	2.40	2.60
Beams, Pittsburgh	2.25	2.35	2.50	2.50
Beams, Philadelphia	2.42	2.57	2.67	2.87
Beams, Chicago	2.45	2.51	2.60	2.60
Tank plates, Pittsburgh	2.25	2.35	2.45	2.50
Tank plates, Philadelphia.....	2.32	2.52	2.62	2.92
Tank plates, Chicago	2.45	2.51	2.60	2.60
Sheets, blk., No. 28, Pittsburgh	3.65	3.70	3.75	3.85
Sheets, blue anl., No. 10, Pitts.	2.80	2.80	2.90	3.00
Sheets, galv., No. 28, Pittsburgh	4.80	4.85	4.90	5.00
Wire nails, Pittsburgh.....	2.90	3.00	3.00	3.00
COKE				
Connellsville furnace, ovens	3.25	3.55	4.00	5.10
Connellsville foundry, ovens	4.25	4.60	4.80	6.10
OLD MATERIAL				
Heavy melting steel, Pittsburgh..	16.00	16.60	21.60	22.20
Heavy melting steel, eastern Pa.	15.00	15.35	18.90	20.40
Heavy melting steel, Chicago ..	14.00	14.65	18.00	19.75
No. 1 wrought, eastern Pa.....	17.75	18.40	21.35	24.40
No. 1 wrought, Chicago	13.50	14.80	17.50	19.95
Rails for rolling, Chicago	15.00	17.10	20.00	21.80

*1.75 to 2.25 silicon **2.25 to 2.75 silicon.

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago.

May 28, 1924	May 21, 1924	Apr., 1924	Feb., 1924	May, 1923	May, 1914
$41.14	$41.22	$42.33	$43.49	$47.52	$22.99

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Westinghouse Net Higher

The Westinghouse Electric & Mfg. Co. reports net income available for dividends of $16,125,303 in the year ended March 31 against $12,263,286 one year before. Sales of $154,412,918 were the second largest recorded. The company earned 18 per cent on common and preferred stocks last year.

Iron and Steel Prices

SCRAP PRICES, PAGE 1460; WAREHOUSE, PAGE 1456; ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1462

Pig Iron

Prices per gross ton

Bessemer, valley	$22.00
Bessemer, Pittsburgh	23.76
Basic, valley	20.00 to 20.50
Basic, Pittsburgh	21.76 to 22.26
Basic, Buffalo	19.50 to 20.00
Basic, del., eastern Pa.	20.75 to 21.25
Malleable, valley	20.50 to 21.00
Malleable, Pittsburgh	22.26 to 22.76
Malleable, Chicago	22.50
Malleable, Buffalo	19.50 to 20.00
Malleable, del., eastern Pa.	22.50 to 23.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	22.39 to 23.76
No. 1X, Buffalo	20.50
No. 2 foundry, valley	20.50 to 21.00
No. 2 foundry, Pittsburgh	22.26 to 22.76
No. 2 foundry, Buffalo	19.50 to 20.00
No. 2 foundry, Chicago	22.50
No. 2 foundry, Granite City	23.00 to 23.50
No. 2 foundry, Ironton fur.	22.00 to 22.50
No. 2 foundry, Cleveland, del.	23.00 to 23.50
No. 2 foundry, del., Phila.	21.39 to 22.76
No. 2 foundry, N. J. tidewater	21.76 to 23.13
No. 2X, eastern, del., Phila.	21.89 to 23.26
No. 2X, east. N. J. tidewater	22.26 to 23.63
No. 2X, eastern del., Boston	24.65 to 25.65
No. 2X, foundry, Buffalo fur.	19.50 to 20.00
No. 2X, Buffalo, del. Boston	24.91 to 25.91
No. 2 southern, Birmingham	21.00 to 22.00
No. 2 southern, Cincinnati	25.05 to 26.05
No. 2 southern, Philadelphia	29.30 to 30.30
No. 2 southern, Chicago	27.01 to 28.01
No. 2 southern Cleveland	27.01 to 28.01
No. 2 southern, Boston (rail and water)	27.91 to 28.91
No. 2 southern, St. Louis	26.17 to 27.17
No. 2X, Virginia furnace	25.50
No. 2X, Virginia, Phila.	30.17
No. 2X, Virginia, Jersey City	31.04
No. 2X, Virginia, Boston	31.41
Gray forge, eastern Pa.	20.50 to 21.50
Gray forge, val. del., Pitts.	21.76 to 22.26
Low phos., standard, valley	29.00
Low phos., standard, Phila.	nominal
Low phos., Lebanon, furnace	25.00 to 27.00
†Low phos., English, Phila.	27.26 to 27.76
Charcoal, Birmingham	31.00 to 33.00
Charcoal, Superior Chicago	29.04

Silvery Iron
Jackson County, Ohio, furnace

7 to 8 per cent	29.00
8 to 9 per cent	30.50
9 to 10 per cent	32.50
10 to 11 per cent	34.50
11 to 12 per cent	37.00
12 per cent	39.50

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 to 11 per cent	39.50
11 to 12 per cent	42.00
12 to 13 per cent	44.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	107.00 to 107.50
Ferromanganese delivered Pittsburgh	111.79 to 112.29
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	35.00 to 38.00
†Spiegeleisen, English, delivered tidewater	35.00 to 38.00
Ferrosilicon, 50 per cent contract freight allowed	75.00
Ferrotungsten standard, cents per pound contained	88.00 to 93.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	10.00 to 10.25
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $3.75
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

†Duty paid.

Coke

Beehive, Ovens

Prices per net ton

Connellsville furnace	$3.25 to 3.40
Connellsville foundry	4.25 to 5.25
New river foundry	9.00 to 10.00
Wise county furnace	4.00 to 4.50
Wise county foundry	4.50 to 5.50
Alabama furnace	5.00 to 5.50
Alabama foundry	6.00

By-Product

Foundry, Newark, N. J., del	$10.41
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.00
Foundry, St. Louis	12.00
Foundry, Granite City, Ill.	12.00
Foundry, Alabama	6.00

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$38.00 to 40.00
Open-hearth, Youngstown	38.00 to 40.00
Open-hearth, Philadelphia	43.17 to 45.17
Bessemer, Pittsburgh	38.00 to 40.00
Bessemer, Youngstown	38.00 to 40.00
Forging, Pittsburgh	43.00
Forging, Philadelphia	47.17 to 50.17

SHEET BARS

Open-hearth, Pittsburgh	$40.00
Open-hearth, Youngstown	40.00
Bessemer, Pittsburgh	40.00
Bessemer, Youngstown	40.00

SLABS

Pittsburgh	38.00 to 40.00
Youngstown	38.00 to 40.00

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh $48.00 to 50.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.20c to 2.25c
Universal skelp, Pittsburgh	2.20c to 2.25c
Sheared skelp, Pittsburgh	2.20c to 2.25c

Shapes, Plates and Bars

Prices per pound

Structural shapes, Pittsburgh	2.20c to 2.30c
Structural shapes, Phila.	2.32c to 2.57c
Structural shapes, New York	2.34c to 2.59c
Structural shapes, Chicago	2.45c
Structural shapes, Birmingham	2.40c to 2.45c
Tank plates, Pittsburgh	2.20c to 2.25c
Tank plates, Philadelphia	2.22c to 2.42c
Tank plates, New York	2.24c to 2.44c
Tank plates, Chicago	2.45c
Tank plates, Birmingham	2.35c to 2.40c
Bars, soft steel, Pittsburgh	2.20c to 2.25c
Bars for cold finishing, Pitts.	2.40c to 2.45c
Bars, soft steel, Philadelphia	2.52c to 2.62c
Bars, soft steel, New York	2.54c to 2.64c
Bars, soft steel, Chicago	2.35c
Bars, soft steel, Birmingham	2.35c to 2.40c
Bars, refined iron, Pittsburgh	3.00c to 4.75c
Bars, rail steel, Chicago	2.20c to 2.23c
Bars, rail steel, mill	2.10c to 2.20c
Reinforcing bars, billet, Pitts.	2.20c to 2.25c
Bar iron, common, Phila.	2.47c to 2.57c
Bar iron, common, New York	2.49c to 2.59c
Bar iron, common, Chicago	2.25c to 2.35c
Bars, forging quality, Pitts.	2.45c to 2.50c

Hoops, Bands, Strip

Prices per pound

Hoops, Pittsburgh, under 5 in.	2.75c to 2.90c
Hoops, Pittsburgh, 20 gage, under 1 in.	3.00c to 3.35c
Bands, Pittsburgh	2.75c to 2.90c
Hot rolled strip steel, Pittsburgh stamping quality	2.60c to 2.75c
Cold rolled strip steel, hard coils, 1¼ inches and wider by 0.100-inch and heavier, base, Pittsburgh	4.50c

Cold Finished Steel

Prices per pound

Cold finished steel bars, Pittsburgh base, carloads	3.00c
Cold-finished steel bars, base Pittsburgh, less carloads	3.00c to 3.25c
Steel shafting, Pittsburgh	3.00c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	25.00 to 28.00
Light rails, 25 to 45, mill	1.90c to 2.00c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.90c to 3.00c
Spikes, small railroad, Pitts.	3.25c to 3.40c
Spikes, boat and barge, Pitts.	3.40c
Spikes, railroad, Chicago	3.10c
Track bolts, Pitts. standard	3.75c to 4.00c
Track bolts, Pitts., small	4.50c to 4.75c
Track bolts, Chicago	4.10c
Tie plates, Pittsburgh	2.50c to 2.55c
Ties plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Prices per pound

Wire nails, Pittsburgh	2.90c
Galv'd nails, 1-inch and over	5.15c
Plain wire, Pittsburgh	2.65c
Annealed wire, Pittsburgh	2.80c
Galvanized wire, No. 9 gage, Pittsburgh	3.25c
Barbed wire, painted, Pitts.	3.35c
Barbed wire, galv., Pitts.	3.70c
Polished staples, Pittsburgh	3.35c
Galvanized staples, Pittsburgh	3.70c
Coated nails, count keg Pittsburgh	2.40c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Sheets

SHEET MILL BLACK

Prices per pound

No. 28, open-hearth, Pitts.	3.60c to 3.85c
No. 28, bessemer, Pitts.	3.60c to 3.85c
No. 28, open-hearth, Phila.	3.92c to 4.07c
No. 28, open-hearth, Chicago	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.75c to 3.85c

GALVANIZED

No. 28, open-hearth, Pitts.	4.75c to 5.00c
No. 28, bessemer, Pittsburgh	4.75c to 5.00c
No. 28, open-hearth, Phila.	5.07c to 5.22c
No. 28, open-hearth, Chicago	5.19c to 5.34c

BLUE ANNEALED

No. 10, open hearth, Pitts.	2.75c to 3.00c
No. 10 bessemer, Pittsburgh	2.75c to 3.00c
No. 10, open-hearth, Phila.	3.07c to 3.22c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22, Pittsburgh	5.10c

Tin Plate

Prices per 100-pound box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel, 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Chain, Piling, Cut Nails

Prices per pound

Chain, 1-in. proof coil, Pitts	6.00c to 6.25c
Sheet piling base, Pittsburgh	2.30c
Cotton ties, bundle 45 lbs. Pittsburgh	$1.71
Cut nails, Pittsburgh	3.00c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$59.20 to 60.20
Six-inch and over, Chicago	55.20 to 57.20
Four-inch, Birmingham	52.00 to 53.00
Six-inch and over Birmingham	48.00 to 49.00
Four-inch, New York	65.60 to 66.60
Six-inch and over, New York	60.60 to 61.60

Standard fittings, Birmingham, base, $110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Scrap Holds Its Position

Little Change in Market, Consumer Buying Being Limited—Dealers Keep Stocks Full—Railroad Tonnages Bring Good Prices

SCRAP PRICES, PAGE 1460

Chicago, May 27.—Iron and steel scrap continues unsettled. Since the sale of melting steel to the Illinois Steel Co. and the Wisconsin Steel Co. dealers have not traded heavily. Railroad offerings are bringing top prices, in many cases more than dealers can obtain. Typical of this is the recent sale of rerolling rails by the Rock Island railroad at $15, tracks, or $15.56 delivered this district. Some dealers believe scrap is a trifle firmer, while others can not see an immediate upturn but on the other hand do not see any indications of further weakness. The market as a whole continues on a basis of $14.50 for melting steel.

Certain Trades Lower

New York, May 27.—Lower quotations on heavy and machinery cast represent virtually the only price changes in the iron and steel scrap market. Heavy cast is being quoted by dealers at $12.50 to $13, New York, and machinery cast at $13 to $14. On the latter material a Phillipsburg, N. J., user is now offering to pay $16.50, delivered.

Quotations on borings and turnings, while unchanged, are nominal, as trading is at a standstill. Much the same situation applies to wrought scrap. The market for melting steel is largely unchanged, with dealers covering on contracts at $15.25, delivered, for shipment to Claymont, Del., and $14.50, for shipment to Conshocken, Pa. The Bethlehem Steel Co. continues to embargo shipments of railroad steel.

Nominal at Buffalo

Buffalo, May 27.—Except for buying of heavy melting steel by one melter nothing is moving in the iron and steel scrap market. Dealers have paid $14 to $15 for heavy melting steel with which to fill old orders taken at $17 to $17.50. It is reported a local mill was able to pick up some steel at about $14, but not from dealers. Reduced demand for No. 1 cast has reduced the price $1 a ton, to a new range of $16.50 to $17.50. Other materials are in so little demand prices are almost entirely nominal.

Prices Discourage Selling

St. Louis, May 26—The situation in iron and steel scrap has failed to develop improvement. Purchasing is confined to spot material and talk of future buying is at prices so low they fail to interest dealers. Recently dealers have been buying for storage but purchases have been selective, both as to grades and prices. Generally yard stocks are still of moderate proportions, and despite low values, there is little disposition to speculate.

Vitually nothing is coming in from outside shipping points. Freight rates and low prices have made shipments from the South and West prohibitive. Texas railroads have discontinued marketing their accumulations, except in small lots to supply local needs, as the $7.50 rate to St. Louis would result in losses on any tonnages forwarded. Even industries in the district, which usually market their scrap from week to week, are letting it accumulate rather than sell at current prices.

Offerings by carriers are less the only lists out being 1000 tons by the Cotton Belt, 200 tons by the Toledo & Western and a blank list by the Big Four. Rolling mill grades are particularly dull but cast scrap recently has showed a little more life. A round tonnage of turnings was purchased by an East side furnace interest.

Little Interest Shown

Cincinnati, May 26.—Little of interest is apparent in the iron and steel scrap market. Some buying is being done in small lots for immediate requirements. Practical absence of trading leaves prices relatively unchanged and it is difficult in the case of some grades to determine the actual market. The Portsmouth mill of the Wheeling Steel Corp. has not taken any scrap in seven weeks, and production has been curtailed at the Ashland plant of the American Rolling Mill Co. Offerings by railroads are heavy. The Louisville & Nashivlle has disposed of a list involving 2,000 tons. The Pennsylvania has entered the market with 40,000 tons, while the Big Four has a list involving 5,000 tons.

Market Loses No Strength

Pittsburgh, May 27.—While dealers are picking up scrap as it is offered at attractive figures for laying down in their yards, this activity is less extensive than a week ago. On the strength of some recent dealer purchases, a few grades are marked up about 50 cents per ton. Heavy melting steel scrap is quotable still at $16 to $16.50. The Westinghouse Electric & Mfg. Co. has disposed of its June scrap, the compressed sheets bringing about $13.15, its plant. The Pennsylvania railroad's combined list again is up for bids, closing June 3. This totals 41,640 tons, or about 5000 tons less than the May list. Among other items it offers 4800 tons heavy melting steel. 5200 tons rail steel, 7250 tons wheels, 4350 tons No. 1 and No. 2 wrought.

Quotations Not Firm

Birmingham, Ala., May 26.—Iron and steel scrap is satisfactory only from one standpoint, there are no cancellation and no instructions to delay deliveries. Quotations are not firm by any means, changes being noted in several grades and many quotations are nominal. It is

(*Concluded on Page* 1407)

Semifinished Market Dull

Specifications Only 25 Per Cent of Normal—Sheet Bars Available at $40, but Buyers Show Little Interest

SEMIFINISHED STEEL PRICES, PAGE 1397

Pittsburgh, May 27.—One seller reports a good order received this week on a $40 slab contract. Another reports weekly specifications from an oil well supply manufacturer on a forging billet contract taken at $43. Sheet bar specifications are rare and $40 is the nominal market. One or two producers refuse to state just what figure a large and attractive tonnage would develop and sheet bar buyers have hopes of being able to purchase at $38 but are not sufficiently confident of the continuation of their own business to test the market with a legitimate inquiry. In fact, no inquiries are out at all for semifinished material, sheet bars, billets, or slabs. Wire rods continue to sell intermittently at $48 to $50, depending upon the quantity. The usual figure is $49, $2 below the market as it prevailed for a long period. Skelp again is inactive as regards new business although shipments continue to be made against a few contracts taken at as high as 2.25c, Pittsburgh.

Market Untested

Philadelphia, May 27.—Billet sales are small. The market is unchanged and untested.

New Business Light

Youngstown, O., May 27.—Specifications for sheet bars have declined to about 25 per cent of normal and new business is lacking to take up the slack. With sheet mills producing at 58 per cent of capacity not much tonnage is being ordered against contracts and as a result the market lacks activity. In the absence of new business sheet bars are quoted at $41, Youngstown. Consumers who could absorb tonnage of a fill-in character would encounter no difficulty in closing at $40, Youngstown.

Market Quiet; Prices Easy

Cleveland, May 27.—Quiet conditions still prevail in the market for semifinished material. Specifications are light, but in line with reduced output. Business is not sufficient to afford a test of prices, and while the market on sheet bars generally is quoted at $41, valley, and billets and slabs at $40, prices at least $1 under these are available with some makers in need of tonnage.

Fluorspar Buying Fair

New York, May 27.—Fair business continues to be done in imported fluorspar. Prices are somewhat easier and current figure on the 85 and 5 per cent grade range from $19 to $20 per net ton, duty paid tidewater. Sales of imported fluorspar are being made as far West as Pittsburgh.

Car Lots Fluorspar Sold

Pittsburgh, May 27.—Single carloads of fluorspar continue to be sold. These bring $19.50 in most instances. The market is quoted at $19 to $20 f.o.b. Kentucky or Illinois mines for the guaranteed 85 and 5 per cent material. Two carloads of fluorspar sold to a nearby user at $18.50

recently proved to analyze low grade, 72 and 26 per cent, and 74 and 30 per cent, respectively. They were turned down by the customer because he was willing to pay more for better fluorspar.

Tin Plate Market

Feels Effect of Backward Season—Japan Closes for 56,000 Boxes

TIN PLATE PRICES, PAGE 1397

Pittsburgh, May 27.—While only an occasional new order for tin plate for domestic consumption is received, usually 15,000 to 20,000 base boxes at a time, specifications against existing contracts represent a fair aggregate so that shipments over a period of a month really are large in point of total tonnage. A few releases are received, but May shipments will not equal April's and this is attributed to the backward season. Not much in the way of anticipating third quarter needs is being done but manufacturers generally feel that a huge demand is being piled up against them for July and August. The domestic price continues firm at $5.50 per base box of 100 pounds, Pittsburgh, on production plate. On stock plate $5 to $5.25 are being secured. On business developing abroad, low prices are appearing somewhat under the English price which is below the United States domestic market figure. For instance on 56,000 base boxes (2800 tons) divided by the Nippon Oil Co., between the Bethlehem Steel Corp. and one independent producer in this vicinity, a price well below $5 per base box, Pittsburgh, was made and while the former manufacturer has a 20-cent advantage in the matter of freight to seaboard over the latter interest, the selling price still must represent a loss.

Books Tonnage for Japan

New York, May 27.—The Bethlehem Steel Export Co. has booked 50,000 boxes of tin plate for the Nippon Oil Co. of Japan.

Seek Protection for Last Half

Youngstown, O., May 27.—Producers of tin plate in this district are quoting production plate for last half at $5.50 per base box, Pittsburgh. While the bulk of the present business being placed is for delivery this quarter, some consumers are closing contracts for protection against last-half demands. Tin plate out of stock is commanding from $5.15 to $5.25 per base box, Pittsburgh, and a fairly good movement of stock items is reported

Takes Over Heat Treating

The Lakeside Steel Improvement Co., 5418 Lakeside avenue, Cleveland, recently organized, has taken over the heat treating business formerly owned and operated by the Steel Improvement & Forge Co., that city. The latter company has discontinued the steel treating department and is devoting its productive capacity to making drop forgings. The plant of the Lakeside Steel Improvement Co. is fully equipped with heat treating facilities to handle material in small to carload quantities.

The McGill Machine Co., Inc., Birmingham, N. Y., has filed a petition in Federal Court at Utica, N. Y., with liabilities of $32,269 and assets of $18,805.

Coke Wage Cut Spreading

More Operators Announce Reductions of 20 to 33 Per Cent—Lack of Business Closes Ovens—Market Is Stagnant

COKE PRICES, PAGE 1397

Pittsburgh, May 27.—The beehive furnace coke market is devoid of features. No tonnage inquiries have appeared since a valley furnace closed at $3.25 for three months as noted last week. Spot sales are reported at $3.25, $3.35 and $3.40. Makers are unable to obtain $3.50. Production has been curtailed further. More ovens are making coke for contract obligations only. Additional wage revisions to the 1917 scale are announced. The Oliver & Snyder Steel Co., cokemakers, Uniontown, successfully reduced wages 20 to 33 1/3 per cent, affecting 700 coke oven workmen and miners. The Consolidated Coke Co. put a similar wage decline into effect at Sterling and Donald plants. Other interests plan to adopt similar rates between now and July 1. Much heating coke is being shipped on gas company and smelter company contracts. Current demand is lacking. Foundry coke selling is limited to single carloads or a few carloads at a time. The price ranges from $4.25 to $6.25. The usual figures on standard selected fuel are $4.50 to $5, although the supply at $4.50 is more restricted and $4.75 usually applies. Premium brands in box cars still bring $6.25.

St. Louis Market Quiet

St. Louis, May 26.—Demand for all varieties and grades of coke continues slow. The principal activity with by-product manufacturers, is the movement to industrial users which is holding up fairly well. The St. Louis Coke & Iron Co. reports sales of small quantities of foundry coke on a basis of $9 to $9.50, f. o. b. Granite City. The leading west-side producer continues to quote $12.

Southern Market Active

Birmingham, Ala., May 26.—The coke market still is showing activity, and the production is being maintained. Shipment of the product is not slowing down. Quotations are firm, by-product foundry coke being held at $6. Some spot tonnage has been sold at $6.50. Furnace coke is offered at $5 to $5.50. Beehive coke is being produced in greater quantity and prices are around $6.

Buying Is Easy

New York, May 27.—An easy tone continues to be reflected in the coke market. On spot standard foundry coke the average range of prices is $4.50 to $5, Connellsville. Some distress lots occasionally are going lower, while on special brands, higher prices are obtained. The by-product foundry coke market continues $10.41, delivered at Newark and other northern New Jersey points.

Furnaces Delay Purchasing

Cincinnati, May 27.—Some beehive coke consumers among blast furnace operators are doubtful about continuing to operate in the third quarter and therefore are halting their fuel negotiations. They are allowing the coke producers to take the aggressive and find some not disposed to cut prices, but to maintain quotations. The spot market on Wise county furnace coke is quiet, with the majority of the producers quoting $4, ovens. A slight improvement in demand for domestic sizes is reported by sellers and as a result prices display a firmer tendency. Several inquiries for third quarter foundry coke are at hand, and several sales involving fair tonnages for shipment into that period have been consummated. The Ashland By-Product Coke Co. has announced that the price of its solvay coke will continue at $7.50, Connellsville, for June shipment. Foundry coke prices are unchanged. Wise county fuel is quoted at $4.50, ovens, while the New River grade ranges from $9 to $10. Owing to a lack of business 75 ovens of a New River coke operation will cease firing June 1.

Motorcar Exports Near Record in 1923

Washington, May 27.—More than 500 automobiles were exported from the United States every day during the year 1923, exclusive of Sundays and holidays, making a total of 152,098 passenger cars and motor trucks shipped abroad during the year. This record has been equaled but once and that was in the boom year 1920.

Of these exports, the largest number was passenger cars, totaling 127,035, valued at $90,692,000. The best 10 markets of the United States in order of their importance were Australia, Canada, Argentina, England, Spain, Mexico, Sweden, South Africa, New Zealand and Cuba.

Motor trucks and busses totaled 24,861, valued at $15,318,000. These were shipped chiefly to Japan, Australia, Canada and England. Electric trucks and passenger cars numbered 202, valued at $286,000. The value of all these cars, together with unit assemblies, parts and accessories, amounted to $165,271,000, or 69 per cent higher than the 1922 value of $98,069,000. This increase raised the automobile group from sixth to third place among American exports.

The gain in the number of passenger cars exported in 1923, according to the analysis of the foreign commerce department of the United States chamber of commerce, was 89 per cent above 1922 and 391 per cent above the prewar average shipments. Motor trucks made a larger quantity increase, 117 per cent greater than in 1922.

During 1923, the Uniter States exported 270,163,000 pounds of automobile parts and accessories, as compared with 160,524,000 pounds in the preceding year, a gain of 68 per cent.

The value of automobile tires exported in 1923 was $17,669,000, 3 per cent less than in 1922, owing to lower prices, the number of tires shipped overseas having increased from 1,381,000 in 1922 to 1,460,000, a gain of 6 per cent.

Bar Buying Is Limited

Consumers Cover Only Current Needs as Mills Make Immediate Delivery—Prices Remain Steady With Fewer Concessions Granted

BAR PRICES, PAGE 1397

Chicago, May 27.—Small merchant demand for soft steel bars is filtering in to the mills but buying by large consuming groups like the implement, automobile and car-building interests continues to be a minimum of their actual requirements. Mills are assiduous in their efforts to unearth business; they believe demand is certain to improve but for the present they are not increasing bookings. Once the price situation is clarified, and this should come about in a few weeks, some business now held back by that factor will be placed. Relatively, the small producer in this district is the better fortified at this time. In Chicago proper 2.35c, Chicago, appears to be the quotation on soft steel bars. Reaching out from Chicago into what is known as the Chicago district the price spread is 2.25c to 2.35c, Chicago. Producers assert the bar price at 2.35c is firming, but some large consumers are anticipating a lower level.

Rail steel bars at 2.20 to 2.23c, Chicago, are in slightly improved demand. Bar iron mills are just maintaining single-turn operations, and the spread is 2.25c to 2.35c, Chicago.

New Buying in Small Lots

Pittsburgh, May 27.—Independent producers of merchant steel bars report a fair number of specifications against contracts, all in small amounts, but the Carnegie Steel Co. states that recently specifications have been heavy in the aggregate. Output is on a fair basis, between 60 and 75 per cent on the average. New buying is limited partly because needs are small and partly because mills are able to ship promptly and railroads to deliver almost immediately. No buying for stock is being done. Large producers report a disappearance of concessions under 2.20c, base Pittsburgh, such as have appeared in recent weeks. The market is firmer at 2.20c to 2.25c.

Refined iron has shown a like measure of receding demand although occasional orders are placed for limited tonnages. So far as can be learned these carry a minimum of 3.00c, base Pittsburgh, although up to 4.75c is named on double refined iron.

Stocks Are Low

Cleveland, May 27.—Consumers of steel bars particularly in the manufacturing class are placing tonnage a little more freely chiefly for filling in purposes, as their stocks apparently are low. Few large amounts are included but the aggregate of the miscellaneous buying is heavier than a week or two ago. A forging company is inquiring for 800 tons of bars for automobile work. Prices continue unchanged at 2.25c, Pittsburgh, and any deviations from this line are infrequent.

Cold Finished Operations Low

Pittsburgh, May 27.—While one or two cold-finished bar producers claim to be able to operate at around 60 per cent of capacity, the general average is about 50 per cent. This is sufficient to indicate the limited way in which buying is being conducted. In some directions it has been necessary for some cold drawn bar finishers to cut down specifications. One or two still are able to demand 3.25c base Pittsburgh on less-than-carload quantities, while others are selling small lots on the carload basis of 3.00c, Pittsburgh, which would indicate that on attractive tonnage concessions below 3.00c have been and will be made.

Demand Is Quieter

Philadelphia, May 27.—Steel bar demand is somewhat quieter and no real market test occurred last week. The general run of the business is going at 2.25c, Pittsburgh, with some occasional tonnage at 2.20c.

Some Hoop Activity Seen

HOOP PRICES, PAGE 1397

Pittsburgh, May 27.—Some large makers of hoops and bands report that incoming business is equal to their present operating rates, about 60 per cent of capacity; one states that his specifications exceed that rate. The majority, however, admit that buying is exceedingly restricted and covers only absolute needs. There is a disappearance, however, of certain low prices such as 2.65c, and 2.75c to 2.90c, base Pittsburgh, again is considered the quotable market.

Nut, Bolt, Rivet Price Fairly Steady

NUT AND BOLT PRICES, PAGE 1462

Pittsburgh, May 27.—Keen competition exists over every inquiry that comes out for nuts, bolts and rivets. Because the available tonnage is spread so thinly operations are more limited and do not average above 50 per cent of capacity. Makers are endeavoring to hold the 60, 10 and 10 off discount on large machine bolts and 2.60c, base Pittsburgh, on structural rivets. Bidding is confined to needs as they arise and occasionally orders are received from jobbers for single carloads. Much warehousing is being done by the mills since so many less-than-carload orders are being accepted.

Railroad Buying Larger

Philadelphia, May 27.—The Philadelphia & Reading railroad last week placed substantial orders for bolts, spikes and other track supplies. The Pennsylvania is inquiring for 200,000 to 400,000 track bolts and miscellaneous materials. The bolt and rivet market is somewhat firmer. Only on the most desirable orders are 2.60c on rivets and 60 and 20 off on bolts being shaded.

Better Feeling Prevails

Chicago, May 27.—A representative of a leading bolt and nut maker just returned from a swing through Kansas, Oklahoma, Colorado, Nebraska and other western states believes the extreme pessimism of the past few weeks has disappeared. Users of bolts and nuts now believe they will have fair business through the remainder of the year. Boom times are not expected but consumption should be on a higher level than at present. A disheartening development is the action of a large Detroit automobile maker in specifying for the third quarter only half of its normal needs for bolts and nuts. On small rivets 70, 10 and 5 prevails while on large rivets the quotation is 2.90c. On large machine bolts 60, 10 and 10 off continues.

Steel Imports

Highest in April Since July, 1923—Exports Recover Slightly

Washington, May 27.—Imports of iron and steel products into the United States in April totaled 50,994 tons, the highest monthly total since July, 1923, when receipts amounted to 53,448 tons, according to reports of the department of commerce. Exports also increased slightly, the April total being 134,627 tons, as compared with 120,596 tons in March and 179,159 tons for April, 1923.

Greatly accentuated receipts of ferromanganese and tubular products were largely responsible for the increase in import totals in April. Ferromanganese imports increased from 1841 tons in March to 6065 tons in April, while tubular products receipts jumped from 2004 tons in the former month to 6375 tons in the latter. Rail imports increased from 394 tons in March to 4621 tons in April.

Increased shipments of rails, scrap, casing and oil line pipe and other pipe products contributed to the gain in exports in April over March.

A full account of imports and exports of iron and steel will appear in next week's issue of IRON TRADE REVIEW.

Strip Order Rate Poor

STRIP PRICES, PAGE 1397

Pittsburgh, May 27.—Hot and cold-rolled strip makers find that orders so far this month, while representing approximately 90 per cent of last month's total, are poor for this time of the year. Operations are about 15 per cent less this month than the average for April. The average now is about 50 per cent of capacity. Believing that nothing is to be gained by offering price concessions producers are maintaining 4.50c, base Pittsburgh, on cold strips, and 2.60c to 2.75c on hot strips, the maximum being necessary on small 10-inch mill sizes. Occasionally 2.50c appears but most makers will not go that low because it means a loss. Stocks in the hands of users are not heavy, particularly in the automotive industry.

Prepare Importers Lists

Washington, May 27.—Trade lists for exporters of railway material, machinery and hardware, have been prepared by the commercial intelligence division of the department of commerce as an aid to American industry. These lists contain the names of im-

porters and dealers in foreign countries and may be had without charge from any of the district co-operative offices of the bureau of foreign and domestic commerce or from Washington.

Valley Mill Operations Change Slightly

Youngstown, O., May 27.—Accumulation of business following a week or more of suspension of certain mills has permitted slightly broader operations this week in the sheet industry here although the continuation of the current rate next week is considered doubtful. Fifty-eight per cent of sheet mill capacity is engaged this week compared with 55 per cent a week ago. The Youngstown Sheet & Tube Co. is operating 19 hot sheet mills, the Trumbull Steel Co. 15, the Newton Steel Co. 10, the Republic Iron & Steel Co. and the Mahoning Valley Steel Co. eight each, the Falcon Steel Co. six and the Waddell Steel Co. four or a total of 70 of the 120 units in the valley.

One less open hearth is operating this week than last, lowering the rate to 44 per cent of district capacity. In addition to the foregoing the Youngstown Sheet & Tube Co. is charging nine open hearths at its two divisions, the Republic Iron & Steel Co. six, the Sharon Steel Hoop Co. five and the Trumbull Steel Co. three, making a total of 23 units active.

Seventy per cent of pipe making facilities are scheduled, the Youngstown Sheet & Tube Co. operating eight of 11 and the Republic Iron & Steel Co. four of six units. The Youngstown Sheet & Tube Co. resumed activity at its 12-inch merchant mill. Its 84-inch plate mill at the Brier Hill division and three skelp mills are engaged but activity at its bessemer department is suspended. The Republic company has three continuous bar and a skelp mill scheduled at its Brown-Bonnell plant. Twenty-nine hot tin mills are under power at the two plants of the Trumbull Steel Co.

Increases Operations

Chicago, May 27.—Steel ingot operations of the Illinois Steel Co. increased slightly in the past week while the Inland Steel Co. experienced a slight decrease. On the whole, ingot operations in the Chicago district continue at about 65 per cent. The steelworks blast furnace situation remains unchanged with 17 out of 30 stacks active.

Furnaces Going Out

Pittsburgh, May 27.—While the Carnegie Steel Co. still has active 35 of 59 blast furnaces, it has scheduled two to be blown out at an early date. It is understood that one of these is in the Edgar Thomson group, where eight out of 11 now are blowing. It has been able to increase steelmaking slightly, going to 52 per cent from 48 per cent, although it is not assured of a 52 per cent ingotmaking rate for all of this week. The average rate in this vicinity among the independents is 50 per cent, which also is the average for many finishing mills such as cold-drawn steel bars, hot and cold-rolled strips, nuts, bolts and rivets, wire and wire products, etc.

Plate Prices Are Easier

Quotation of 1.90c, Pittsburgh, Shaded on Important Business—Chesapeake Revives Inquiry for 12,000 Tons of Steel—Market Quiet

PLATE PRICES, PAGE 1397

Pittsburgh, May 27.—Construction involving the use of plates is somewhat more limited, as typified by inquiries being received. Large tonnages are practically absent. No inquiries for oil storage tankage are being received and it is understood that this line of activity has been adversely affected by the recent cuts in the price of crude oil. Small needs are promptly met by plate producers and many of these demands are so small they do not reach the mills but are filled from jobbers' warehouses. The market price appears to be stabilizing itself on a 2.25c basis. However, 2.20c still appears on favorable tonnages. A small tonnage of plates is involved in the two steel dump scows on which the United States engineers at Pittsburgh will take bids until June 18.

Buyers More Active

New York, May 27.—Plate buying in this district is somewhat more active, and keen competition has developed on some of the most desirable business. The usual business involving carloads or more continues to bring 2.00c to 2.10c, Pittsburgh, but on the more desirable blocks less is being done, and in at least three instances 1.90c, Pittsburgh, was shaded. The Matson Navigation Co. has announced that it intends to order a new vessel shortly, to require about 6000 tons of steel. No decision yet has been made on the boat for the New York & Porto Rico Steamship Co.

Sentiment Is Improved

Cleveland, May 27.—A better general demand has sprung up in the plate market in small lots and sellers report that total bookings are the best in a number of weeks. Some consumers are placing carload orders for stock. Sentiment appears to have been improved. Prices are softer in that 2.20c, Pittsburgh, has been appearing more frequently, particularly from close by mills. Some buyers are seeking to close at 2.10c but there are no indications that they have been successful. Nothing further has developed concerning a recent inquiry of 2000 tons of 2-inch plates arising in connection with oil refinery work.

Little Support in Evidence

Chicago, May 27.—With railroad freight car buying at a minimum and oil storage tank work still in a tentative state, the steel plate market is without the support of the two factors that have been most active in sustaining it. Merchant demand is light. The price situation is weak and confused. In Chicago proper the going quotation is 2.45c, Chicago, but in the reaches of what is called the Chicago district it is claimed that a price figuring back as low as 2.35c, Chicago, has been done.

Receives Large Inquiry

Philadelphia, May 27.—The Chesapeake & Ohio railroad is again inquiring for 12,000 tons of plates, shapes and bars for 1000 gondolas. Otherwise large tonnages are lacking. Current business continues sufficient to keep eastern mills operating at 40 per cent. On important business 1.90c, Pittsburgh, has been materially shaded, but this is believed to be the lowest price quoted by mills not in the eastern district. The general market here is around 1.90c to 2.00c on attractive lots, with occasional sales at a higher price. Bids are expected to be called for shortly for a boat for the American-Hawaiian line, requiring 6000 tons of plates.

Alloys Are Dull

Some Users Asking Anticipation of Shipments—Prices Steady

FERROALLOY PRICES, PAGE 1397

Pittsburgh, May 27.—Ferroalloy producers and sellers are encouraged in the present dullness because consumers of ferromanganese are asking that shipments be anticipated. A request was received last week that some July material be allowed to come forward this month and another asked that the July quota be shipped in June. It is thought that further buying will have to be done should this second-half material be utilized during first half, anticipating estimated needs. Second-half inquiries for ferromanganese are not developing rapidly, two or three being out for single carloads or 100 tons only. One sale of about 100 tons is noted. The market price is unchanged at $107.50, seaboard base. Indian ferromanganese is being offered here at the rate of any part of 500 tons monthly at about $4 under the prevailing market on English and domestic material. The Indian ferromanganese, however, is guaranteed 75 per cent or over in manganese, running 76 to 78 per cent, and some users do not care for this low grade even at the price advantage. A 1-ton lot of English material was sold here this week at $120, Pittsburgh. One seller recently received specifications for three cars against a 50 per cent ferrosilicon contract. The price is unchanged at $75, freight allowed. A sale of 500 pounds of ferrochrome is noted at 11 cents. The contract price on 6 and 8 per cent carbon material is unchanged at 10¼ cents. Intermittent interest is encountered in ferrotungsten and ferrovanadium, and prices are unchanged.

Sales Are Small

New York, May 27.—Sales of ferromanganese during the past week have been a few hundred tons for quick shipment. The business has been booked at $107.50 duty paid tidewater. Business in spiegeleisen is confined to carloads which are going at $37 to $38, furnace, for 20 per cent metal.

Oklahoma Tool & Supply Co., Tulsa, Okla., has decreased its capital stock from $1,000,000 to $5000.

Concrete Buying Better

Activity in Closing Small Tonnage Lots Gives Market More Cheerful Tone—Prices Generally Are Firm—Inquiries Steady

REINFORCING BARS, PAGE 1397

Chicago, May 27.—Severe competition for reinforcing bar business has lowered the price here to a level that all sellers agree is ruinous when contrasted with the mill price for soft steel bars. Some of the larger reinforcing bar jobs have brought out a price of 2.40c or less; some of the smaller work is bringing up to 2.60c. Today it is probable that 2.45c, Chicago, is the single price most nearly representing the market. A large number of contracts for from 5 to 10 tons of bars has been closed in the past week. Wherever possible the contractors on larger jobs are deferring their buying to the last moment.

Road Builders Lead Demand

Buffalo, May 27.—Practically the only inquiry for reinforcing bars comes from road builders. About 1000 tons are included in inquiries on which bids are being taken in this district. None of these is for more than 125 tons. Little new construction inquiry is coming out. Prices are steady and unchanged.

Market Quiets Down

Cincinnati, May 27.—Considerable tonnage of reinforcing bars is being bought in lots under 100 tons. Larger projects are not being closed. After the unusual activity of the past few weeks, this condition is not unexpected. Sellers of these bars have large order books and are prepared to be continuously busy for some time on present commitments. On carbon steel bars the Pollak Steel Co. is quoting 2.30c, base Marion, O., while the market price on plain steel bars on shipment out of warehouse continues unchanged at 3.30c to 3.50c, base Cincinnati.

Concrete Bar Buyers Defer

Pittsburgh, May 27.—Action is deferred on a number of projects involving reinforcing concrete bars. One bid filed on the Melwood apartment house for the Melwood Realty Co., Pittsburgh, was so low that it is understood new bids are going to be requested. This project involves 185 tons. A bank building at Uniontown, Pa. for the Citizens' Title & Trust Co., takes 205 tons; bids are being filed this week. The Y. M. C. A. building at Cumberland, Md., will take between 100 and 150 tons and bids likewise are going in today. Numerous small jobs are up for attention which, with some additional state road work, will require an attractive aggregate tonnage. Prices are unchanged at 2.20c to 2.25c, base Pittsburgh, for new steel bars.

Many Small Tonnage Lots Up

Cleveland, May 27.—Many projects requiring small tonnage lots of reinforcing concrete bars now are in the market. Most jobs require 60 tons and under, but the aggregate of these contracts is sufficient to maintain shop operations at a fair rate. A considerable amount of road work is being placed, most of which is in small tonnage lots. Bourne-Fuller Co. took 360 tons in several road jobs in Lake county. Concrete Steel Co. also has taken several hundred tons in the last few weeks in Ohio and Pennsylvania road work. New steel bars continue 2.25c to 2.30c, Pittsburgh, untested, while rail steel bars are 2.00c to 2.10c, mill. Warehouse stocks continue to go at 2.50c to 2.75c, Pittsburgh, with considerably less being done on attractive business.

CONCRETE CONTRACTS PLACED

Awards this week	**6,498 tons**
Awards last week	**5,470 tons**
Awards two weeks ago	**4,693 tons**

2500 tons, power plant for the Philadelphia Electric Co., Philadelphia, to the Concrete Steel Co. and Kalman Steel Co.

800 tons, Hartman Furniture Co. building, Chicago, to Joseph T. Ryerson & Son, Inc. R. F. Wilson & Co., 1851 Elston avenue, Chicago, general contractor.

500 tons, building for E. R. Squibb & Sons, Brooklyn, N. Y., to Jones & Laughlin Steel Co.

400 tons, Stimson building, Seattle, to Pacific Coast Steel Co.

360 tons, road work in Lake county, Ohio, to Bourne-Fuller Co.

350 tons, Lady of Mercy high school, Milwaukee, to Concrete Steel Co.

350 tons, addition to Wieboldt store, Chicago, to Barton Spider-Web System.

200 tons, Masonic temple, Spokane, Wash., to Pacific Coast Steel Co.

200 tons, St. Agnes Hospital, Fond du Lac, Wis., to the American System of Reinforcing.

200 tons, Illinois highway bridge work, to Concrete Steel Co.

150 tons, Shorewood school, Milwaukee, to Concrete Steel Co.

150 tons, plant for Bates Valve Bag Co., Chicago, to Joseph T. Ryerson & Son, Inc. R. F. Wilson & Co., 1851 Elston avenue, Chicago, general contractor.

120 tons, United States Radiator Co. addition, Detroit, to the Concrete Steel Co.

118 tons, Bell Telephone station at Philadelphia, to Concrete Steel Co.

100 tons, Anderson Forestry building, University of Washington, Seattle, to Pacific Coast Steel Co. General contract awarded to John Arlington, 2451 Federal avenue, Seattle.

CONCRETE CONTRACTS PENDING

800 tons, Ninth street viaduct, Los Angeles; bids June 2.

760 tons, Bradner-Medico building, Seattle; bids being received.

573 tons, Drainage Improvement District No. 8, Los Angeles; Francisco & Ellington, Los Angeles, low bidders.

500 tons, building for Insurance Co. of North America, Philadelphia; pending.

500 tons, Veterans' hospital, Aspinwall, Pa.; W. F. Trimble & Sons Co., Pittsburgh, low bidder at $711,000.

450 tons, factory for A. J. Lindemann & Hoverson Co., Chicago; general contract let to Great Lakes Construction Co., 308 South Wabash avenue, Chicago.

450 tons, Klamath river bridge, Humboldt county, Cal.; bids being received.

375 tons, building for American Can Co., San Francisco; bids being taken.

350 tons Medico Dental building, San Francisco, Geo. Wagner, general contractor.

300 tons, Cicero avenue bridge, for Sanitary district of Chicago; Fitzsimons & Connell Dredge & Dock Co., 10 South LaSalle street, Chicago, general contractors.

275 tons, 10-story office building, Nineteenth and Broadway, Oakland, Cal.; general contract to Palmer & Clinton, San Francisco. Steel not yet placed.

260 to 300 tons, building for Ohio Bell Telephone Co. at Canton, O.; plans out in about a month.

205 tons, building for the Citizens' Title & Trust Co., Uniontown, Pa., bids being filed this week.

185 tons, Melwood apartment house, Melwood Realty Co., Pittsburgh; action deferred.

180 tons, factory building for Aluminum Cooking Utensil Co., Forty-sixth and Linden streets, Oakland, Cal. Plans by engineering department of the company, Philadelphia. K. E. Parker Co., San Francisco, general contractor.

170 tons, Exchequer dam and power house, Merced Irrigation district; R. V. Meikle chief engineer, Merced, Cal.; bids May 31.

150 tons, Y. M. C. A. building, Cumberland, Md.; bids being filed this week.

140 tons, 2-story building for Kleiber Co., Inc., 1480 Folsom street, San Francisco. Austin Co. of California, Santa Fe building, San Francisco, taking bids.

126 tons, hospital Alameda, Cal.; Alfred H. Voget, general contractor.

100 tons, garage for C. B. Pasqualette, Jackson and Mint streets, San Francisco; bids being received.

100 tons, office building, First and San Carlos streets, San Jose, Cal., for Sainte Claire Realty Co. General contract placed with Cahill Bros., San Francisco.

100 tons, filtration plant at Ford City, Pa.; bids close June 16.

100 tons, St. James hospital, Chicago Heights, Ill., Schmidt, Garden & Martin, 104 South Michigan avenue, Chicago, engineers; bids to be asked shortly.

Tonnage unstated, 2500-seat theater on West Madison street, Chicago, for Lubliner & Trinz; E. P. Steinberg, 109 North Dearborn street, Chicago, engineer.

Tonnage unstated, 3000-seat theater at Milwaukee and Sawyer avenues, Chicago, for Lubliner & Trinz; Fridstein & Co., 111 West Washington street, Chicago, engineers.

Pipe Mill

Operation Rate Drops—Price Concessions Appear—Cast Buying Steady

PIPE PRICES, PAGE 1397 AND 1462

Pittsburgh, May 27.—Since the last cut in crude oil prices, less activity in the way of pipe buying is noted on the part of oil companies or oil country jobbers. Because jobbers have made a studied effort to liquidate their stocks of standard full weight merchant pipe, offering attractive prices for that purpose, purchases from the mills have been along more restricted lines. All this has had a telling effect upon operation schedules among plants in this vicinity as well as in the Mahoning valley. Some of these which were operating about 90 per cent during the first three or four months of the year now are down to 65 to 75 per cent of capacity. No large orders are being placed but a fairly steady inflow of one to three carload specifications at a time is noted. Mill prices of last April continue firm on pipe although on boiler tubes, various attractive concessions are being made as noted last week, as much as three extra discounts of 5 per cent each, without stimulating much buying.

Municipal Buying Lacking

New York, May 27.—Private buying continues to be the chief support of the local cast iron pipe market, as municipal demand is all but lacking. Prices continue steady, particularly on the smaller sizes of pipe, on which most of the shops still are well booked ahead. While it appears that the larger sizes of pipe might be subject to shading, there has been of late little tonnage of size to afford a test.

More Jobs Being Closed

Chicago, May 27.—One maker of cast iron pipe booked a greater number of orders last week than in any week this year. The aggregate was not extremely large but it evidences buying on a fair scale by many users. Among jobs upon which bids will be opened in a few days, or contracts should be awarded shortly, are 400 tons by the South Park commissioners, Chicago, 800 tons by Lucas county, Toledo, O., 349 tons at Jacksonville, Ill., 100 tons at Waconia, Minn.,

and 250 tons at Winona, Minn. On the 6800 tons at Detroit, the American Cast Iron Pipe Co., the United States Cast Iron Pipe & Foundry Co. and the Lynchburg Pipe Foundry Co. each are low on portions. Cast iron pipe quotations are unchanged at $55.20 to $57.20, Chicago, for 6-inch and over and $59.20 to $60.20, Chicago for 4-inch.

Lettings Are Aggregating Less

Birmingham, Ala., May 26.—Lettings being received by the cast iron pipe makers are aggregating less in tonnage and manufacturers now are hoping for a turn for the better. Capacity operation is to be noted at the several plants in this district. No intimation is given that there will be any immediate slowing down in operations.

CAST IRON PIPE PLACED

750 tons, Columbus, O., to the United States Cast Iron Pipe & Foundry Co.
490 tons, Greeneville, Tenn., to American Cast Iron Pipe Co.
185 tons, Fort Worth, Tex., to American Cast Iron Pipe Co.
126 tons, Laurinburg, N. C., to American Cast Iron Pipe Co.
110 tons, Memphis, Tenn., to American Cast Iron Pipe Co.

CAST IRON PIPE PENDING

800 tons, Lucas county, Toledo, O.; bids in.
400 tons, South Park commissioners, Chicago; bids in.
228 tons, 10 and 12-inch pipe for Monrovia, Cal.; bids in.
150 tons, Montreal, Que.; bids in.
100 tons, Kelso, Wash., 4 to 8-inch class C pipe; bids in.

Wire Price Lower

Accept Former Minimum to Apply on All Orders—Operations Drop

WIRE PRICES, PAGE 1397

Pittsburgh, May 27.—Incoming business in wire products at the rate of about 50 per cent permits operation at 60 per cent on the average. This comparatively high operating rate is reducing backlogs somewhat and while a few producers have 30 to 45 days' business ahead, this is not the rule. Some have orders on hand for only a week or two. Most makers have settled upon 2.65c and 2.90c, base Pittsburgh, respectively, as the market prices for plain wire and wire nails. One maker claims still to be confining those prices to buyers of large lots. Jobbers are not ordering heavily in any one direction.

Demand Is Much Less

Buffalo, May 27.—The unusually late season has caused heavy decline in sales of wire cloth and other seasonal products of wire mills. Jobbers have not begun to replenish stocks, as is usual at this season of the year. Operation of mills here has been cut 40 per cent, it is estimated.

Drops to Lower Level

Chicago, May 27.—Business in wire and wire products has receded further and operations of local makers approximate only 50 per cent of capacity. Jobbers continue to buy sparingly because of the prompt delivery mills can make. Not much basis for immediate improvement can be discerned. The price situation is weak with quotations ranging from 2.65c to 2.75c, Pittsburgh, for plain wire and 2.90c to 3.00c, Pittsburgh, on wire nails.

Sheet Interest Is Lacking

Some Users Buying from Jobbers To Keep Down Stocks—Slight Increase in Activity at Pittsburgh—Prices Stable

SHEET PRICES, PAGE 1397

Youngstown, O., May 27.—While district operations advanced from 55 to 58 per cent this week this reflects better balanced specifications and the accumulation of tonnage by certain producers whose mills have been suspended for a short period rather than of increased interest on the part of the trade. Demand for all grades of sheets is lagging. Various producers here are searching out tonnage and while their efforts are not resulting in the booking of a large volume of business, in the aggregate the return is encouraging.

Prices for all grades of sheets are firm, producers here quoting blue annealed at 2.80c, black at 3.65c and galvanized at 4.80c, base Pittsburgh. Reports coming from district offices in the South point out that galvanized is being offered there at $1 below the going market but investigation discloses the product is being offered by an Ohio galvanizer rather than a mill and therefore, coated sheets for production are not involved. This is a common occurrence in a quiet market.

Specifications for galvanized tonnage already entered are low in volume and this has necessitated slowing down operation of galvanizing departments to about 30 per cent of district capacity. Despite slackness in this direction, however, producers here are not quoting this grade below 4.80c, base Pittsburgh. Inquiry is being made at some mills although no large tonnage is involved.

The percentage of orders resulting from quotations against tentative requirements shows no increasing tendency but at the same time no backsliding of the market is apparent. Immediate shipment is wanted by the majority of consumers now taking tonnage out of the market. High-grade sheets also are firm at 5.10c for No. 22 gage, Pittsburgh. Consumers are not carrying inventories as high as earlier in the year and on most of the business being placed reasonably quick delivery is desired.

Fair Business Filtering In

Chicago, May 27.—Steel sheets production in the Chicago district has felt no further diminution and while rolling schedules present many holes, shipments are quite fair when contrasted with the general state of the finished steel market. The minimums in the Chicago district continue 4.80c, Pittsburgh, for galvanized, 3.65c for black and 2.80c for blue annealed.

Activity Increases Slightly

Pittsburgh, May 27.—A slight increase in activity is noted in connection with various grades of sheets but the majority of buyers only are taking what they must have. Prompt deliveries possible from any of their sources of supply make them indifferent about anticipating coming wants. Jobbers are enjoying a splendid buying rate, much of which is from sources they do not ordinarily serve. Under the present program many sheet buyers usually taking a carload or more at a time from the mills, are not doing so but are ordering a few tons at a time from jobbers at $12 to $15 per ton more than the mill price, just to keep their stocks as low as possible. With so much tonnage remaining to be taken out in the second quarter, no interest as yet is attached to third quarter needs and no price announcement is being made for deliveries that far ahead. The announcement probably will not come out for two weeks or more. Occasionally an order for automobile sheets comes through. In some cases this material is being ordered in for new models scheduled to appear in July. One order was received here this week by telegraph involving several hundred tons. The price on full finished automobile sheets is unchanged and firm at 5.10c, Pittsburgh. The price situation in general appears to have made progress toward a more stable basis. The number of manufacturers quoting less than 2.80c, 3.65c and 4.80c respectively, on blue annealed, black and galvanized sheets, is restricted to a few who need business even if they have to take it at a loss. The levels mentioned are $4 per ton below the American Sheet & Tin Plate Co.'s prices, 3.00c, 3.85c and 5.00c, Pittsburgh. While one producer of black sheets quoted as low as 3.55c, respectively, the usual concession stops at 3.60c. In connection with galvanized, one West Virginia maker quoted as low as 4.60c recently, or $8 per ton under the leading interest's level. This case was exceptional, however, and possibly could not now be duplicated. An Ohio buyer of black sheets which operates three galvanizing pots, has accumulated a large stock of material, 90 per cent of which still is in the black state, and is offering this stock galvanized at 4.75c, Pittsburgh. Operations are practically the same as a week ago, one or two sheet producers being able to increase by 2 to 5 per cent. The general average is 60 to 65 per cent of capacity.

Prices Generally Firm

Philadelphia, May 27.—Sheet prices are being shaded in some instances, but makers generally are holding firmly to 2.80c, Pittsburgh, for blue annealed; 3.65c for black and 4.80c for galvanized. Eastern mills are operating at 60 to 70 per cent. Orders are not quite replacing shipments.

Move To New Laboratories

The Pittsburgh Testing Laboratory announces the completion and occupancy of its new laboratories and offices on Stevenson street at Locust, Pittsburgh. The most improved type of testing machinery and chemical apparatus have been installed. The scope of activities of the company has been enlarged in the new quarters.

Joseph Tuttle Stearns has been appointed receiver of the Dewey Supply Corp., manufacturer of road building machinery, New York. Liabilities are about $12,000 and assets about $8000.

Shape Inquiries Numerous

Present Inactivity Regarded As Temporary—Many Projects Being Figured Quietly—Railroads Continue To Take Large Tonnage for Bridgework

STRUCTURAL SHAPE PRICES, PAGE 1397

New York, May 27.—Railroad demand continues a feature of the local structural market. Commenting on this situation, one large fabricator stated that railroad buying has been at a higher rate this year than in the seven preceding years, and that the prospects for additional good buying are bright. All indications, he said, point to this being a good railroad year. Buying so far cannot be described as heavy, nevertheless, its has shown a substantial improvement. Demand is comprised chiefly of rather small tonnages, principally for bridge work.

Commercial buying is not as large as it was a month ago, but according to most fabricators, it is of satisfactory volume. Most leading sellers are inclined to discredit the belief in some quarter that demand over the next couple of months will likely undergo a substantial decline. They assert that there is much new work in sight. Locally, the continued strike of the ironworkers is a depressing factor.

The plain material market appears less steady than it did a week or so ago. While 2.20c to 2.25c Pittsburgh still may be regarded as the market on the general run of business, there is a greater tendency to shade in some instances.

Fabricators' Awards All Small

Pittsburgh, May 27.—Immediate vicinity awards of structural shapes all involve small tonnages. Bids were closed yesterday on a 900-ton bridge over the Susquehanna river at West Milton, Pa., which is to be built by Union and Northumberland counties. Harry Wimer, Butler, Pa., received the general contract for the new building for the Butler Savings & Trust Co, that city, involving 360 tons. The Pittsburgh-Des Moines Steel Co., in common with other local shops, reports that it has received numerous small orders originating all the way from Seattle, Wash., to Miami, Fla., no one of which involved a reportable tonnage. The market on plain material is quotable this week at 2.20c to 2 30c, base Pittsburgh. The 2.35c figure no longer appears to be obtainable and 2.30c is now the maximum price on small lots. While 2.25c is the more general price, 2.20c has applied recently on attractive tonnages

Jobs Plentiful; Awards Few

Chicago, May 27.—Hesitation in closing still marks the structural market in this district. Estimating departments encounter no dearth of work but the general uncertainty in business and the indefinite state of prices are deterrent. The North Works of the Illinois steel Co., has taken the 3800 tons in the W. F Hall Printing Co. job. Bids on 2000 tons for an addition to the Roosevelt hotel, New Orleans, have been rejected. In Chicago proper the quotation on plain material is 2.45c, Chicago, but this is weak and it is reported that in adjacent territory a price figuring back as low as 2.35c, Chicago, has been done.

Market Is Encouraging

Cincinnati, May 27.—The structural market holds up along encouraging lines, despite the fact that total bookings last week are reported lower than for the week previous. Between 300 and 400 tons are involved in the Westminster building, Dayton, O., which will be ready for figuring shortly. Bids went in May 23 on the addition to the First National bank at Portsmouth, O., which involves about 200 tons. Several other good sized jobs are contemplated. The general market ranges from 2.10c to 2.25c, base Pittsburgh, on plain shapes.

Lower Prices Appear

Philadelphia, May 27.—Somewhat lower prices appeared here last week on structural shapes in some quarters and the market now is 2.00c to 2.20c, Pittsburgh. Eastern shape makers now are quoting a mill basis rather than Pittsburgh on an increasing proportion of their business.

Activity Confined to Small Lots

Cleveland, May 27.—Activity in the structural market in this district last week was confined for the most part to unimportant developments. Many projects are up, most prominent of which is the 4000 tons required for Pennsylvania railroad grade elimination work. Bids are in on this material and some fabricators report the project to be placed. Few awards involving large tonnages were reported last week, although a good tonnage in the aggregate was placed. Donovan Wire & Iron Co. was awarded 900 tons for a building in Toledo. There are many projects now under cover which are awaiting successful financing before proceding. These are expected to materialize in the summer or fall. Fabricators in the northern part of Ohio are operating at from 25 to 60 per cent of capacity, although some local fabricators with small plant capacity are booked full. Plain material prices have steadied at 2.25c, Pittsburgh. Fabricated prices have no gauge, with some interests taking losses to book tonnage. One project in this territory recently went at less than $80 erected, although generally fabricators are holding to higher levels.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 14,855 tons
Building awards last week..... 23,169 tons
Building awards two weeks ago.... 25,301 tons

3800 tons, W. F. Hall Printing Co. plant, Chicago, to North Works of Illinois Steel Co.

1500 tons, Commerce high school, Sixty-fifth street and Amsterdam avenue, New York, to Lehigh Structural Steel Co.

900 tons, Fifty Associates building, Toledo, O., to Donovan Wire & Iron Co.

900 tons, apartment in East Orange, N. J., to Hedden Iron Construction Co.

685 tons, Masonic Temple building, Springfield, O., to Massillon Bridge & Structural Co.

600 tons, Adam, Meldrum & Anderson store, Buffalo, N. Y., to Pittsburgh Bridge & Iron Co.

600 tons, apartments at 860 Park avenue, New York. Post & McCord awarded erection contract.

600 tons, repair shop for transit commission, Coney Island, N. Y., tentatively awarded to American Bridge Co.

500 tons, parochial schools, East Seventy-eighth street, New York, to National Bridge Works

500 tons, bridge at Corpus Christi, Tex., to Wisconsin Bridge & Iron Co.

450 tons, building for Pennsylvania Glass Sand Co., at Lewistown, Pa., to McClintic-Marshall Co.

400 tons, sawmill for Michigan Iron, Land & Lumber Co., Iron Mountain, Mich., to Worden-Allen Co.

370 tons, bridge No. 6, Central of New Jersey, Allentown, Pa., to the Phoenix Bridge Co.

365 tons, alterations and additions to freight house of Illinois Central railroad at Memphis, Tenn., to Virginia Bridge & Iron Co.

350 tons, coal breaker for Alden Coal Co., Luzerne county, Pa., to McClintic-Marshall Co.

250 tons, Transit shed, Mormon island, Los Angeles, to Virginia Bridge & Iron Co.

200 tons, Buffalo Sintering Co., Buffalo, N. Y., to Bancroft-Jones Corp.

200 tons, nurses training school, Bellevue hospital, New York, to Lehigh Structural Steel Co.

175 tons, Plummer building, Turk and Jones streets, San Francisco, to Central Iron Works.

150 tons, Stevenson street bridge, Buffalo, N. Y., to American Bridge Co.

150 tons, Logan Bank building, New Kensington, Pa., to the McClintic-Marshall Co.

150 tons, bridge for the Reading railroad, to the McClintic-Marshall Co.

150 tons, East Youngstown school, Youngstown, O., to unnamed fabricator.

150 tons, addition to French & Hecht, Davenport, Iowa, to Rock Island Bridge & Iron Works.

150 tons, plates and shapes, gas holder, Eureka Cal., to Stacey Mfg. Co.

150 tons, De Martina Bros. building, California street near Jones, San Francisco, to Central Iron Works.

140 tons, Kennan apartments, Jackson and Gough street, San Francisco, to Central Iron works.

120 tons, bridge near Chester, Pa., for Philadelphia & Reading railroad, to McClintic-Marshall Co.

100 tons, addition to S. S. Kresge store, Buffalo, N. Y., to McMannus Steel Construction Co.

100 tons, bridge for the Boston & Maine railroad, to the McClintic-Marshall Co.

STRUCTURAL CONTRACTS PENDING

20,000 tons, additional tonnage for Philadelphia-Camden Delaware river bridge, Philadelphia; bids to be asked in about a month.

5000 to 5500 tons, Miami Fort power station, near Cincinnati, Sargent & Lundy, Chicago, engineers; bids in June 2.

3000 tons, anchorage work for Philadelphia-Camden Delaware river bridge, Philadelphia; bids being taken.

2700 tons, Keeler hotel, Albany, N. Y.; bids again asked.

2000 tons, teachers training school, 135th street and Nicholas, New York; pending.

1800 tons, Cicero avenue bridge for sanitary district of Chicago; plans out by Sanitary district, 900 South Michigan avenue that city, in about 60 days.

1000 tons, Jonathan club, Los Angeles; bids to be asked shortly.

1000 tons, Central of New Jersey railroad bridge, Somerville, N. J., previously noted; action expected shortly.

1000 tons, public school No. 73, Bronx, New York; pending.

900 tons, bridge over the Susquehanna river at West Milton, Pa., to be built jointly by Union and Northumberland counties; bids closed May 26.

850 tons, state highway bridge over the Susquehanna river, Pennsylvania; bids asked.

700 tons, passenger station, Chesapeake & Ohio railroad, Ashland, Ky.; bids asked.

600 tons, school No. 19, New York; pending.

560 tons, Mount Lake Bridge and 95 tons machinery, State of Washington; bids in June 27.

400 to 500 tons, auditorium, Stockton, Cal.; bids in June 23.

400 tons, Westminster building, Dayton, O.; bids asked.

360 tons, bank for the Butler Savings & Trust Co., Butler, Pa.; general contract awarded Harry Wimer, that city.

340 tons, bridge at Highbridge, Mt. Vernon, Wash., for Pacific Northwest Traction Co. Pending.

300 tons, Citizens National Bank building,

Mansfield, O.; bids in early in June.
300 tons, state highway bridge, Vermont; pending.
300 tons, substation, Public Service Corp., Newark, N. J.; pending.
300 tons, bridge for the Reading railroad, near Philadelphia; pending.
300 tons, two New Jersey state highway bridges; pending.
300 tons, highway bridge for Chesapeake & Ohio railroad; bids asked.
300 tons, small shop buildings, for the Central of New Jersey, Elizabethport, N. J.; bids asked.
275 tons, hotel, Eddy and Jones streets, San Francisco, for A. Vayssie; building held up on account of finances.
250 tons, apartment house Broadway and Octavia streets, San Francisco; bids being received by Fred W. Quandt, Humboldt Bank building.
200 tons plates, two steel dump scows for the United States Engineers, Pittsburgh; bids close June 18.
200 tons, junior high school building for Rostraver township, Westmoreland county, Pa.; bids close June 12.
200 tons, addition to First National Bank, Portsmouth, O.; pending.
200 tons, hospital, Pittsfield, Mass.; pending.
200 tons, bridge repairs, Fall River, Mass.; pending.

Refractories Quiet

Reflect Decline in Iron and Steel Operations—Prices Fairly Stable

Pittsburgh, May 27.—Backlogs of refractory business are disappearing as shipping instructions are received to apply on old orders or standing contracts. Few new orders are being taken to replace them. The decrease of operations in the iron and steel industry generally of 25 or 30 per cent is reflected in similar declines in fire clay and silica brick demand. Some kilns which have been operating at 80 per cent are planning to cut; others have been down to 60 per cent and the general average is no higher than 65 per cent of capacity. A great deal of the brick being made is going into producers' sheds, although consumers' stocks generally are conceded to be low. While there has been no marked increase of buying for repair purposes during the present dull period, it is expected that as usual when consumers see improved business ahead they will commence to order brick. The brickmakers' improvement usually antedates the iron and steel improvement by two to four weeks. Plans for the building of a blast furnace in St. Louis and one at Everett, Mass., is expected to develop some large brick orders, in excess of 1,000,000 brick each. Prices generally hold firmly at $42 to $45 on Pennsylvania No. 1 fire clay brick, although on some large contracts $40 was done. The $38 level on silica brick is fairly general. Chrome and magnesite brick are unchanged at $45 and $65, respectively, although on the former, one interest still reports ability to obtain $47 on single carloads.

Belgian Exports High

Washington, May 27.—Total exports of iron and steel products from Belgium in 1923 totaled 2,018,732 tons, according to reports from the department of commerce, or slightly higher than those from the United States in the same period which amounted to 2,009,141 tons. Of the total shipped from Belgium, South America took approximately 30 per cent.

Railroad Market Quiet

Few Large Inquiries for Equipment Now Before Builders—Track Accessory Demand in Good Volume—Rail Awards Are Lacking

RAILROAD TRACK MATERIAL PRICES, PAGE 1397

New York, May 27.—Predictions that buying of freight cars this month will fall well under that of any corresponding period so far this year are being borne out by the continued dullness of demand. Both orders and inquiries are small and scattered. Locomotive buying the past week has also been small and includes the purchase of one locomotive by the Cornwall railroad, from the Baldwin Locomotive Works.

Canadian Roads to Expand

Washington, May 27.—The Canadian government has introduced bills for the construction of 26 branch lines for the Canadian National railway, with a total mileage of 946, consular advices to the department of commerce state. It is proposed to spend $25,966,000 on these projects.

Billet-Rolled Rails Lower

Pittsburgh, May 27.—In order to share in some of the going business on light rails, makers of billet-rolled rails have gone to 1.90c, Pittsburgh. On some orders 2.00c still prevails. Rail-steel light rails have sold again at 1.85c, but it is understood that quotations lower than that have appeared. Single carload orders continue to rule although less numerous than a few weeks ago. Needed material alone is being bought in track accessories and new buying accordingly is limited. Shipments against contracts have been fairly numerous so that backlogs have been greatly reduced. Standard spikes usually bring 2.90c and small spikes 3.40c, the same as boat and barge spikes. On standard track bolts, as low as 3.75c recently has been done and tie plates are quoted at 2.50c to 2.55c, base Pittsburgh.

The Pressed Steel Car Co. recently received an order for 36 skelp cars from the Gary Tube Co., 20 of 100-ton capacity and 16 of 70-ton capacity.

Fastening Situation Improving

Chicago, May 27.—Not only are local makers of track fastenings receiving heavy specifications against contracts but they also are finding new business better. Recent bookings are for fair tonnages from a number of sources. In the past week 5000 kegs of spikes in the aggregate have been booked. A number of angle bar and tie-plate contracts should be placed shortly.

New business in steel rails is light but specifications against contracts continue heavy. Most new rail business has ranged from 200 to 500 tons and fits nicely into rolling schedules.

New business in railroad freight cars is not heavy. The Mount Vernon Car Co. has booked 220 cars for the Florida East Coast railroad. The Rock Island is in the market for repairs to 250 refrigerator cars.

CAR ORDERS PLACED

Phillips Petroleum Co., 75 tank cars, to General American Tank Car Corp. This is in addition to 125 recently awarded to that builder.
Gary Tube Co., 20 100-ton skelp and 16 70-ton skelp cars, to the Pressed Steel Car Co.
Atchison, Topeka & Santa Fe, 20 baggage cars, to the Pullman Co.
Florida East Coast, 200 wooden ventilated box cars and 20 caboose cars, to the Mt. Vernon Car & Mfg. Co.
Florida East Coast, three passenger cars, to Pullman Co.

CAR ORDERS PENDING

Chicago, Rock Island & Pacific, repairs to 250 refrigerator cars; pending.
Delaware, Lackawanna & Western, 40 caboose cars; bids asked.
Central of Vermont, 12 steel underframes for caboose cars; pending.
Pere Marquette, 34 caboose car underframes; pending.
Tonopah & Tidewater, three gondola cars; pending.
Sandy Valley & Elkhorn, repairs to 500 hopper cars; pending.

Warehouse Prices Lowered

WAREHOUSE PRICES, PAGE 1456

New York, May 27.—Quotations on hoops, bands and blue annealed sheets have been reduced by the leading independent jobber. This interest is now quoting hoops at 4.59c; bands, 4.09c and blue annealed sheets at 4.14c. These prices are predicated on mill prices of 3.25c for hoops; 2.75c for bands and 2.80c for blue annealed sheets, and are fast being adopted by other jobbers. The situation otherwise is unchanged and in the opinion of some usually well informed trade interests, few additional changes are likely in the near future.

The curtailment of production at many of the mills is forcing some consumers into the warehouse market for their immediate requirements. Trading last week was well maintained, with orders small but numerous. Buying of reinforcing bars continues an outstanding feature.

Many Small Orders Placed

Buffalo, May 27.—Warehouse business is notable for the number of orders rather than for individual sales or total tonnage involved. Contractors are buying structural material for part of their requirements, due to mills asking 30 days for deliveries on some sizes. All purchases are on a piecemeal basis, consumers having little confidence in prices, despite the fact that local quotations have been and are firm.

Prices Are Firmer

Philadelphia, May 27.—Prices of iron and steel products in warehouses here reflect less shading, for instance, 3.00c, base, in bars, plates and shapes, now is less apparent and 3.05c, is the minimum on attractive business with exceptions here and there. Demand continues slow.

Better Weather Aids Buying

Cleveland, May 27.—Better weather has strengthened demand for iron and steel products from warehouses, building materials now moving better. Small tonnages continue to rule and prices remain firm. General business volume still is under the rate in April.

The Nonferrous Metals

Prices Sink Further in Dull Buying but Copper and Zinc Then Become Firmer and More Active

	Copper—Electro delivered	Copper—Lake delivered	Spot tin Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Spot nickel
May 21	12.87½	13.25	41.00	7.20†	5.70	27.00	8.62½	28.00
May 22	12.75	13.25	40.50	7.12½	5.65	27.00	8.62½	28.00
May 23	12.75	13.12½	39.87½	6.87½	5.62½	27.00	8.62½	28.00
May 26	12.75	13.00	41.00	6.95	5.67½	27.00	8.62½	28.00
May 27	12.45	12.87½	41.25	6.95	5.67½	27.00	8.50	28.00

†Outside market quotation.

NEW YORK, May 27.—Metal prices have declined in dull and dragging markets here and abroad. Consumers have maintained the policy of buying only for prompt requirements and avoiding accumulating inventories. The passage of the bonus bill over the President's veto was followed by a sharp reaction in metal prices generally, reflecting decreased confidence in business. By Monday this week, however, a slight recovery was manifest, beginning in London, which marked up quotations throughout the list. The unsatisfactory financial situation in Germany together with the slowing down of industry in this country have been depressing the markets in London and the American markets have followed London closely.

All the industries affiliated with the copper business working from electrolytic copper as a base, have experienced price weakness. The market for electrolytic sagged last week to 12.62½c, delivered Connecticut, recovering on Monday to 12.75c. Some business was done in the Middle West at 12.87½c, Chicago. Casting copper sold down to 12.25c, refinery, for export, though little domestic business was done under 12.37½c. Lake copper sold at 12.87½c to 13c, delivered.

Zinc declined to its low for the year at 5.60c, then recovered to 5.65c to 5.70c, East St. Louis. Smelter stocks are believed to be accumulating this month, due partly to reluctance of some smelters to accept current prices.

The American Smelting & Refining Co. reduced its contract price ¼ cent to 7.00c, New York, the outside market also declining ¼ cent. Future shipment lead sold down to 6.50c, East St. Louis, 6.87½c, New York. Consumers still seem to think the market unreasonably high and are buying only against "must" requirements.

Tin prices sagged to the low for the year at 39.87½c, with London down to a level nearly £100 under the high level of March. Some consumers have been buying future shipments ,but in general both dealers and consumers are moving cautiously. Spot Straits tin premium has declined to ¼ cent.

The price of virgin ingot aluminum remained 27c, delivered.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 4 oz., min..	20.25
High brass	16.75
Zinc, ga. 9 to 18 (plates ½c less)	9.50
Lead, full sheets (cut ¼c more)	11.25
Aluminum, bright, 0 to 35 gage..	37.50 to 92.00
SEAMLESS TUBES	
High brass	21.00
Copper	22.25
RODS	
High brass, round, ⅜ to 2½-inch	14.50
Naval brass rods	17.25
WIRE	
Copper	15.125 to 15.375
High brass	17.25

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	8.75
New York	8.00 to 8.25
Chicago	8.50
HEAVY YELLOW BRASS	
New York	6.00 to 6.25
Chicago	6.50
Cleveland	5.75 to 6.00
ZINC	
New York	3.75 to 4.00
Cleveland	3.00 to 3.25
Chicago, dross	4.25
HEAVY COPPER AND WIRE	
Cleveland	9.75 to 10.00
New York	10.00 to 10.25
Chicago	10.00
RED BRASS TURNINGS	
New York	7.50 to 7.75
Cleveland	7.00 to 7.50
Chicago	8.00
YELLOW BRASS TUBING	
Cleveland	6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00
New York	6.50 to 6.75
Chicago	6.25
ALUMINUM BORINGS	
Cleveland	10.00

Beehive Coke Output Shows Slight Increase

Washington, May 27.—After seven weeks of steady decline, the production of beehive coke recovered slightly in the week ended May 17 according to the geological survey. The total output in that week is now estimated at 182,000 net tons, as against 178,000 tons in the preceding week. The principal improvement occurred in Pennsylvania and Ohio, where the recent curtailment was greatest. Production in the Southern group of States decreased from 19,000 to 13,000 tons. The showing by weeks for districts follows:

	—Week ended— May 17, 1924a	May 10, 1924b	May 19, 1923
Pennsylvania and Ohio	143,000	133,000	333,000
West Virginia	10,000	9,000	23,000
Alabama, Kentucky, Tennessee and Georgia	13,000	19,000	22,000
Virginia	7,000	7,000	17,000
Colorado and New Mexico	5,000	5,000	9,000
Washington and Utah..	4,000	5,000	7,000
United States Total ..	182,000	178,000	411,000
Daily average	30,000	30,000	69,000

(a) Subject to revision. (b) Revised from last report.

The production of soft coal continues on a higher scale than a few weeks ago. Consumption is less than late in 1923, when it was running at the weekly rate of 10,200,000 tons. It has not fallen so low as production, however, and it follows that consumers are using up their stocks.

By-Products Quiet

Curtailment of Production Is Steadying Factor

New York, May 27.—While business in coal tar by-products generally is slower, prices are virtually unchanged. A gradual curtailment in production is a steadying factor.

Pure benzol may be quoted at 24 to 25 cents, works in tanks, and 30 cents in drums; 90 per cent, 22 to 23 cents works in tanks and 28 cents works, in drums; xylol, 28 cents works in tanks and 33 cents in drums; toluol 26 cents in tanks and 30 cents in drums; and solvent naphtha, 25 cents in tanks and 32 cents in drums. A noticeable feature is the slowing up in demand for benzol on the part of the dye industry, a seasonal development.

Quotations on sulphate of ammonia are nominally unchanged. On business for domestic account the market is holding at $2.60 to $2.65, works, and on material for foreign shipment, $2.60 to $2.65, port, in double bags. Little inquiry has developed from the fertilizer manufacturers.

Naphthalene is quiet with prices holding around 5½ cents, works, for flakes and 6½ cents for balls. Phenol also is unchanged at 25 cents, works on contract shipment and approximately 27 cents, local stores on spot shipment.

Coke Oven By-Product

Spot*

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.24 to $0.25
Toluol	0.26
Solvent naphtha	0.25
Commercial xylol	0.28
Per Pound at Producers' Plants	
Phenol	0.27
Naphthalene flake	0.05½
Naphthalene balls	0.06½
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.60 to $2.65
Contract	
Pure benzol	Nominal
Toluol	Nominal
Solvent naphtha	Nominal
Commercial xylol	Nominal
Per Pound at Producers' Plants	
Phenol	$0.25
Naphthalene flakes	0.05½
Naphthalene balls	0.06½

*Spot distillates are subject to shading.

Thinks Bottom Reached

New York, May 27.—President Eugene G. Grace states that the plants of the Bethlehem Steel Corp. are operating at present at about 50 per cent of capacity. He said that sentiment is a little better and that if President Coolidge's veto of the bonus bill had been upheld a buying movement would have started. He said, however, that bottom has been touched.

Brick Production

Drops in April, Silica Declining 19 Per Cent and Fire Clay 4

Pittsburgh, May 27.—Data compiled and issued by the Refractories Manufacturers' association for April show that in silica brick the production fell off to a greater extent than did fire clay. In the former, the drop amounted to 19 per cent, going from 6,604,985 brick in March to 5,045,843 brick in April. The fire clay brick decline amounted only to 4 per cent of capacity reporting, the production for March being 42,776,856, while for April it was 41,966,199. Shipments of silica likewise fell off, the percentage of decline being 16, as against a 2 per cent decline in fire clay shipments. Net new business in fire clay fell off 4 per cent, going from 75 per cent in March to 71 per cent in April, while in silica, net new business declined from 67 per cent in March to 51 per cent in April. The detailed figures follow:

FIRE CLAY

	April 30, 1924	March 31, 1924
Capacity reporting	52,632,300	51,132,300
On hand last day preceding month	141,345,102	133,526,240
Production	41,966,199	42,776,856
Shipments	38,282,634	28,111,554
On hand last day current month	145,028,667	138,191,542
New orders received during month	38,308,366	38,931,427
Cancellations	767,891	492,577
Net new business	37,540,475	38,438,850
Unfilled orders last day current month	54,365,887	50,632,764

SILICA BRICK

	April 30, 1924	March 31, 1924
Capacity reporting	8,019,667	8,019,667
On hand last day preceding month	12,950,174	12,809,951
Production	5,045,843	6,604,985
Shipments	5,186,110	6,464,762
On hand last day current month	12,809,907	12,950,174
New orders received during month	4,122,765	6,053,185
Cancellations	7,900	666,706
Net new business	4,114,865	5,386,479
Unfilled orders last day current month	8,717,420	9,788,665

The apparent great difference between the stocks on hand April 30, 145,028,667 fire clay and 12,809,907 silica brick, and the unfilled orders of that date, 54,365,887 fire clay and 8,717,420 silica, is explained by the fact that stocks on hand include large quantities made up in advance of the receipt of actual orders. These stocks are of course not available for the open market and could not be applied upon new orders. The actual "free" stock of 9-inch straights on April 30 was, in fire clay 67,805,009 and in silica, 6,094,237 brick.

The Spicer Mfg. Co., South Plainfield, N. J., manufacturer of universal joints and propeller shafts for the automotive industry, reports net profit for the first quarter of 1924, $379,120 after expenses, interest and discounts. This compares with $511,426, in the first quarter of 1923.

British Exports of Steel Gain in April

Exports of iron and steel products from Great Britain during April amounted to 336,799 long tons, a gain of 17 per cent over shipments abroad in March, according to a cable to the department of commerce by Commercial Attache Walter S. Tower, London. Imports gained 20 per cent over the preceding month, reaching a total of 198,902 tons in April, the highest figure for any month in 1924. The largest increases in the articles exported were registered for pig iron and ferroalloys, railway material other than rails, steel bars, rods, angles and galvanized sheets, while exports of plates and sheets, rails and wrought tubes, pipes and fittings dropped off considerably. The growth in imports was accounted for by heavy receipts of pig iron and ingots, blooms, billets, etc.

During the first four months of 1924, exports of iron and steel totaled 1,293,198 tons, and imports aggregated 696,078 tons.

The production of iron and steel at British plants declined in April, 618,400 tons of pig iron and about 711,000 tons of steel ingots and castings being turned out. This compares with 668,600 tons and 825,200 tons, respectively, in March, and is under the average of production for the first quarter of the current year. At the end of April there were 194 blast furnaces and 330 open-hearth furnaces in operation, whereas the close of March found 195 blast furnaces and 337 open-hearth furnaces active.

Mechanical Engineers in Spring Meeting

The annual four-day spring meeting of the American Society of Mechanical Engineers was opened at the Hotel Cleveland, Cleveland, May 26, with an unusually heavy registration. Activities of that morning consisted of a meeting of the council and a local sections' conference. A business meeting was held in the afternoon with Fred R. Low, editor of *Power*, New York, and president of the society, presiding. Tellers on the constitutional amendment on the increase in dues reported that the membership had approved the increase in dues from $15 to $20 per year.

Technical sessions were opened on Tuesday morning, May 27, four simultaneous meetings being held on machine shop practice, windmill and fan design, power problems of the steel industry and materials handling in industrial plants. In the afternoon members and guests went to Akron where they were to be shown through several rubber plants. In the evening a joint dinner meeting was held with the Akron local section of the American Society of Mechanical Engineers. Fred E. Ayer, dean of the engineering college, Akron university, presented an address on "The Engineer in Politics." This was followed by a brief address by President Low.

Penn Steel Reports Loss

Operations of the Penn Seaboard Steel Corp., Philadelphia, in the first three months of this year resulted in a net loss of $17,506. This compares with net income of $44,443 in the corresponding period of 1923. Operations at the company's four plants now average about 55 per cent of capacity, and business on the books is sufficient for about 30 days' operations at this rate, officials assert. Stockholders of the company have approved an increase in the authorized capital stock from 1,200,000 to 1,500,000 shares. They have also authorized a reduction in the number of directors from 15 to 11. The increased capital stock is to take care of necessary additions to working capital.

Scrap Holds Its Position

(*Concluded from Page* 1398)

significant that dealers are watching their own stock, maintaining fairly good yard forces and laying in as much tonnage as they are moving out.

Upward Tendency Reflected

Philadelphia, May 27.—Iron and steel scrap reflects a definite upward tendency. Chemical borings and heavy cast are up 50 cents but the general level is unchanged, due to a lack of business. Some encouragement is given the upward tendency because several consumers are feeling out the market. No. 1 steel is now quoted at $14.50 to $15.50, delivered.

Easy Feeling At Detroit

Detroit, May 27.—An easier feeling is apparent in the iron and steel scrap market, especially foundry grades. Open-hearth grades are holding the recent advance. Mills are still out of the market to a large extent, say dealers. There have been some sales between dealers but not as much as a week ago.

Buying Is Limited

Cleveland, May 27.—Iron and steel scrap movement is extremely limited and chiefly among dealers who cling to the belief that prices have reached bottom and are buying the light offerings of producers. They are putting this in stock to meet demands of consumers expected to develop within the next 60 days. Quotations are unchanged from last week, but in the absence of important transactions, are largely nominal.

Europe Is Selling to America

French Works Books 3000 Tons of Pipe for New Jersey Public Service—British Makers Take Orders for Galvanized Sheets and Pig Iron—Germans Close for Shapes for Brazil—Financial Difficulties in Ruhr Increase

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, May 27.—Transactions with American buyers are conspicuous in the markets this week. A tonnage of galvanized sheets have been sold at £18 ($78.21) c.i.f. Atlantic seaboard. Several thousand tons of hematite have been sold as low phosphorus iron for delivery to the United States at £4 18s ($21.28) f.o.b. The French correspondent of IRON TRADE REVIEW reports from Paris that Pont-a-Mousson has sold 3000 tons of cast pipe to the New Jersey public service corporation. Some inquiries from the United States for ferromanganese are pending in the British market.

British producers have booked good orders for cars for export. Shipbuilders have taken contracts for seven merchant vessels, stimulating the plate market, which otherwise is dull.

A report from Berlin states that the financial crisis involving iron and steel works in the Ruhr is increasing in severity. The strike of miners has resulted in the banking of many furnaces. German mills have sold some shapes for delivery to Brazil.

British Steel Market Quiet Under Many Checks

European Staff Special

BIRMINGHAM, Eng. May 16.—Various unfavorable circumstances have checked business and quiet conditions prevail generally. The determination of the government to abolish the McKenna duties has cut down some prospective order for motor steel and a variety of special steels for which Sheffield is the principal source of origin. The statistical record of production during April fairly accords with the general expectation. Pig iron output was 618,400 tons as compared with 668,600 tons in March and steel ingot production 711,500 tons against 816,900 tons in March. A drop of over 100,000 tons indicates a substantial set-back, but railway orders are tapering off somewhat and shipments exceed bookings.

Pig iron exports have received a slight check and home buying is slow. No. 3 Cleveland G. M. B. is generally quoted at £4 12s ($20.10) but sales have been made at £4 11s 6d ($19.99) f.o.t.

A little improvement is reported from Barrow-in-Furness. For the present the ten furnaces in that area are sufficient for requirements, but stocks are now rapidly disappearing. The Continent is a better buyer of these low phosphorus qualities. Home demands have also slightly improved. Better port inquiry is being met with in Scotland.

The most encouraging feature of the steel trade is gradual expansion in demand from shipyards. This is chiefly in connection with repair work, but orders for new ships are also increasing. Glasgow is benefiting somewhat but the improvement is more marked on the North east coast whose yards get their supplies from the Middlesbrough area. Building demands are also slowly expanding. There is an absence of big construction work, but undertakings calling for small tonnages make a fairly large aggregate. An insolated quotation offers French steel bilets at £6 9s ($28.18)

Sterling—$4.36

to £6 12s ($28.84) Antwerp and foundry pig iron at £4 16s ($21.41) to £4 18s ($20.97). Neither of these is a business quotation. One or two spot lots of billets have been offered at £7 5s ($31.68) delivered and found ready purchasers, although the prospect of delivery is remote.

Competition Is Keen

It is still possible to buy English billets at £8 ($34.96) but most works quote £8 5s ($36.05) to £8 10s ($37.14) with some firmness. As already suggested steel motor business has been checked by the government action in regard to protective duties. But against this is the undoubted fact that many motor builders are in arrears with deliveries, and refusing orders where anything like early delivery is a condition. Keen competition for orders has depressed prices a little in certain finished departments, certain re-rolling firms now accepting orders for small bars and steel skelp for the tube making at £10 10s ($45.88) per ton. The present price for Staffordshire iron skelp is £13 10s ($58.99) and in spite of the relatively high price many orders are being placed for iron skelp for tubes.

It is still possible to buy No 3 Belgian iron for nut and bolt manufacture at £8 10s ($37.14) delivered as against £11 10s ($50.25), the Stanffordshire price. But thousands of tons of foreign material have yet to be delivered and consumers are disposed to get this material before placing new orders.

Galvanized sheets show decided weakness, with little new business and sales have been made at £16 17s 6d ($43.74), prices ranging between this figure and £17 ($74.29). Some of the largest makers are now wanting business and are ready to cut prices to get it. Export figures show an increase of nearly 9000 tons over the previous month, with larger totals to India, Argentine and New Zealand. A few well placed firms are still disposed to quote much higher prices according to the state of their books.

In tin plate the downward tendency of tin has so far justified a waiting policy, recent sales having been at £1 3s 6d ($5.13). A number of makers are prepared to sell at this price. The question of reducing the scheduled figure authorized by the stabilization committee has again been raised, but this is unlikely to ensue, and as against any such action it is pointed out that the present basis was fixed when the tin price was practically the same as at present. It seems unlikely that the basis will be interfered with unless steel prices change substantially. The fact has not escaped notice that Canadian tinplate imports from the United Kingdom totaled 58,129 tons for the four months against 49,288 for the corresponding period for last year.

Steel scrap is weak, large imports continuing to depress prices of home material. It is well known, however, that stocks of steel scrap in this country are not large, and in view of the cautious buying of the last few months merchants are inclined to look for recovery in values.

French Exports Larger

Paris, May 16.—Returns of French steel exports for March show an increase of 35 per cent over February exports and of nearly 60 per cent over January. This is the result of the boom which France enjoyed in export business owing to the depreciation of the franc. It is to be expected that a sharp decline will follow in April. The total tonnage of steel exported in March was 274,960 metric tons valued at 221,064,000 francs, or 77,316,000 francs more than in February. Pig iron

The Business Trend

May 29, 1924

BY JOHN W. HILL, FINANCIAL EDITOR

THE business structure is developing a better state of balance. General recovery is not yet in evidence, but sharply reduced outputs are having a steadying effect upon some lines.

Trade sentiment is a shade more confident. Among the industries where a faint quickening of the pulse is noted, are hides, shoes, primary cotton goods, soft coal, pig iron and iron and steel scrap. One great locomotive plant plans to increase operations.

Wage cuts have helped New England shoe mills to speed activities. Coal output is gaining after dropping below consumption, with a reduction of 7,000,000 tons in stocks. Some crude oil prices are up after recent cuts.

The worst of the industrial decline probably has been seen. Overproduction largely has been checked. Drifting tendencies are likely for a time. The date of recovery depends upon the size of stocks and how soon they will be worked down by consumption.

Confidence Is Reflected

Financial sentiment has exhibited faith in the outlook. The stock market quickly recovered from the first shock of the passage of the bonus bill. Congress, which adjourns June 7, soon will pass as an adverse business factor.

The compromise revenue measure falls short of perfection. The Mellon rates have been sidetracked. The senate publicity provision for tax returns has been modified but it still is odious. The inheritance tax is held unsound.

On the other hand, the bill offers immediate tax relief. It would give a 25 per cent rebate on 1923 income taxes, and the objectionable corporation surplus tax has been dropped. The question whether it will bring a deficit is in dispute.

Tax Relief Needed

Business and individuals need tax relief this year. Profits are smaller. Employment is declining and wages are being reduced in a growing number of lines. The purchasing power of wages is 30 per cent above the 1923 level, but it is shrinking.

Offsetting this loss, living costs are falling. The cost of living dollar on the 1914 basis is worth 62 cents, against 60 cents in December and 48 cents in 1920. Bargain sales are increasing to stimulate retail trade now lagging after recent high totals.

Credit grows easier. Rediscounts of the federal reserve are down 40 per cent in a year. The great reservoir of excess credit is being tapped into the investment market. Liberty bonds have continued to rise despite the bonus.

The Barometer of Business

Weekly Comparison

	Last week	Week before	One mo. ago	One year ago	1913
Business Failures ..	449	387	390	355	...
Cash ratio Fed. Res. System % .	83.7	83.0	81.6	75.6	...
Loan rate, 4-6 mos. N. Y. %..	4-4¼	...	4½-4¾	5-5¼	52
Aver. 25 industrial shares	$106.86	$105.51	$107.26	$108.18	$58.19
Aver. 25 railroad shares	$63.48	$62.45	$61.75	$60.82	$82.97
Aver. 40 bonds ..	$78.93	$78.65	$78.27	$78.21	$93.00
Car loadings, week ended May 10 ..	909,187	914,187	881,299	974,531	*843,145
Bank debits, 246 cities (000 omitted)	$9,970,246	$9,501,343	$9,085,094	$9,641,460	.....

*1920

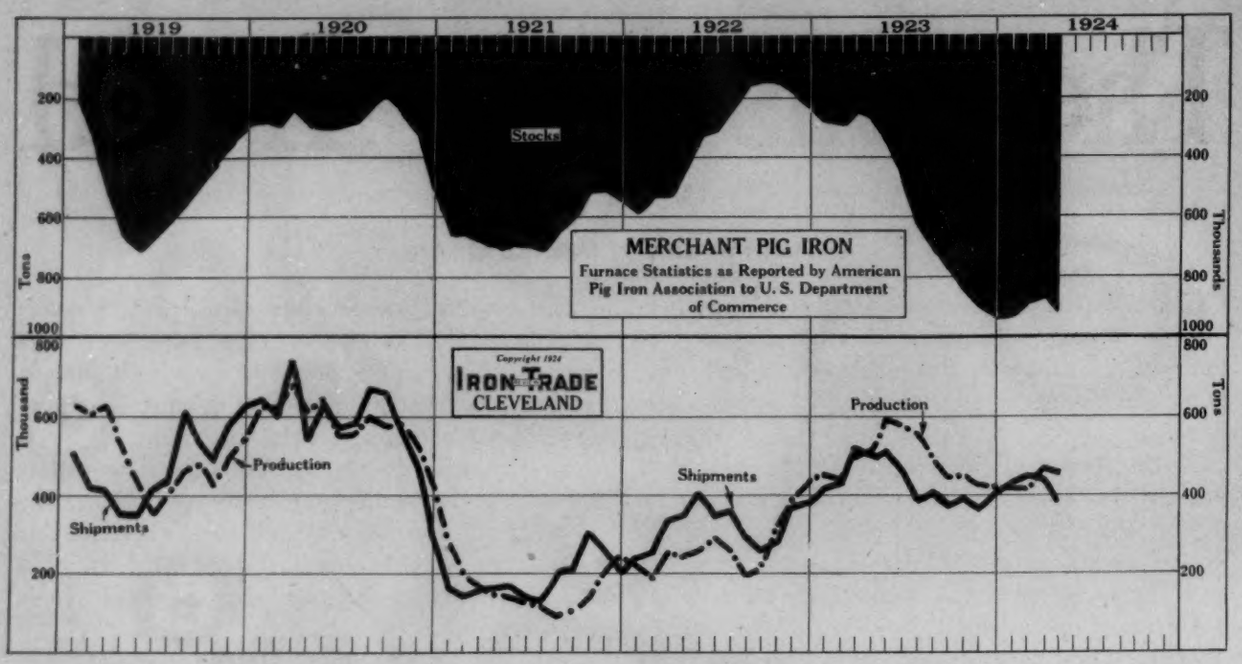
Foreign Exchange (Demand)

	Normal	Last week close	One week before	One month ago	One year ago
Sterling	$4.86	$4.34	$4.39	$4.38	$4.62
Francs	19.3c	5.40c	5.72c	6.50c	6.61c
Lira	19.3c	4.41c	4.44c	4.49c	4.78c

Monthly Comparison

		One Month before	One Year ago	1913 Mo. average
Dodge Building awards in 27 states (sq. ft.)	63,347,400	68,425,100	65,378,100	31,250,000
Business failures: Number	1,707	1,817	1,520	1,336
Liabilities ...	$48,904,452	$97,651,026	$51,491,941	$22,732,000
Exports	$348,000,000	$339,674,106	$325,492,000	‡$233,195,000
Excess of gold imports	$44,027,000	$34,606,000	$8,533,000	†$630,716
Bureau of labor price index ..	148	150	159	100
Bradstreet's price index	135.8	136.9	147.8	100
Economist's British price index	170.6	170.8	163.4	100
Nat'l Industrial Con. board living cost index	161.8	163.5	159.1	‡100
New incorporations	$528,900,000	$808,923,700	$1,006,300,000	$49,301,000
Railroad net earnings	*$80,239,885	$71,191,664	$84,124,312	$59,301,000

†Excess of gold exports ‡July, 1914. *March.

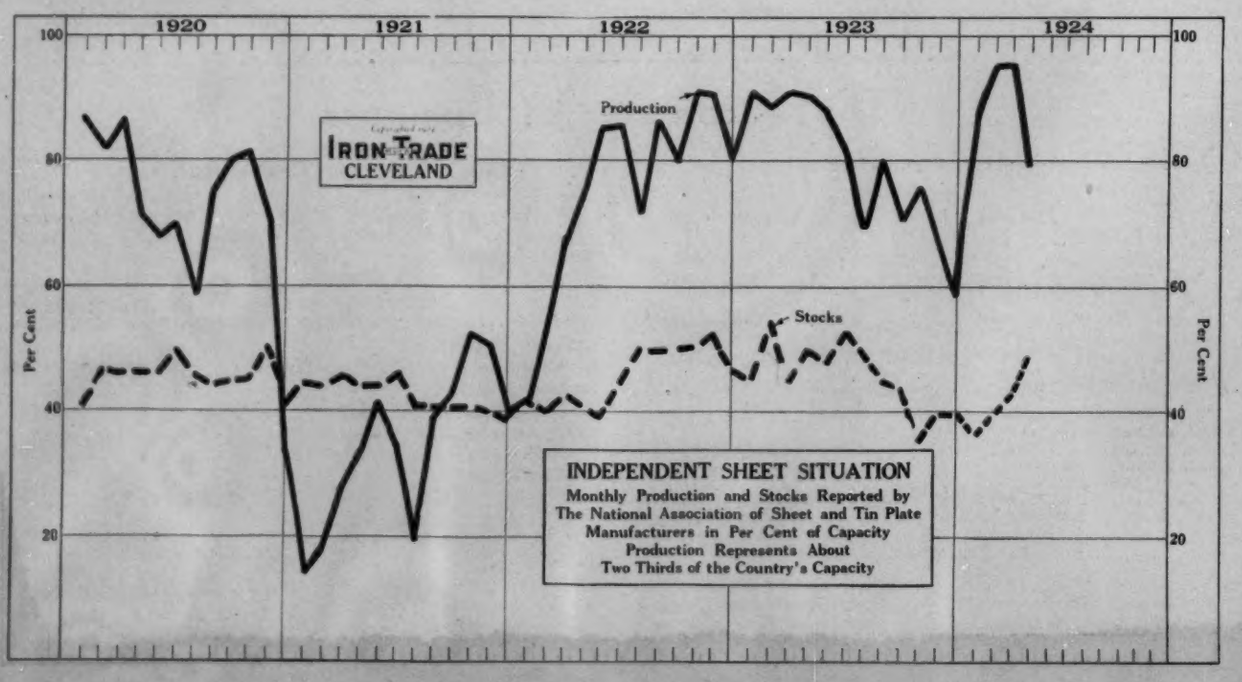


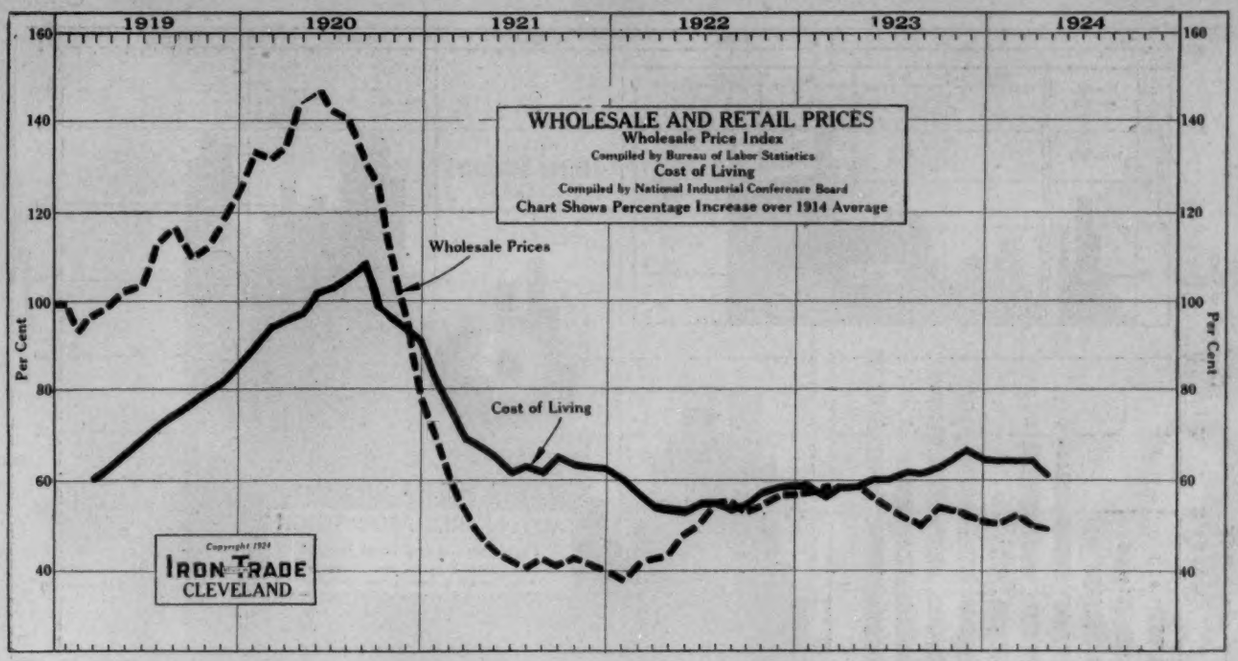
Merchant Iron Situation

WITH this issue Business Trend presents a new monthly diagram picturing the merchant pig iron situation. In the upper section of the chart is shown the volume of stocks on hand, always an overhanging factor in any commodity market. In the lower section are pictured the curves of production and of shipments. As indicated, stocks at furnaces of the American Pig Iron association at the end of April totaled 944,774 tons, the largest ever recorded. Production dropped slightly and shipments were smaller.

Independent Sheets

SALES of sheets produced by members of the National Association of Sheet & Tin Plate Manufacturers declined sharply in April. Total sales amounted to 182,903 net tons or 61.8 per cent of capacity. This compared with 251,411 net tons in March or 87 per cent of capacity. Production dropped from 96 per cent of capacity in March to 79 per cent in April. Stocks awaiting shipment increased from 28.6 per cent of capacity in March to 31.3 per cent in April. Unsold stocks gained from 15.2 per cent to 16.5 per cent.



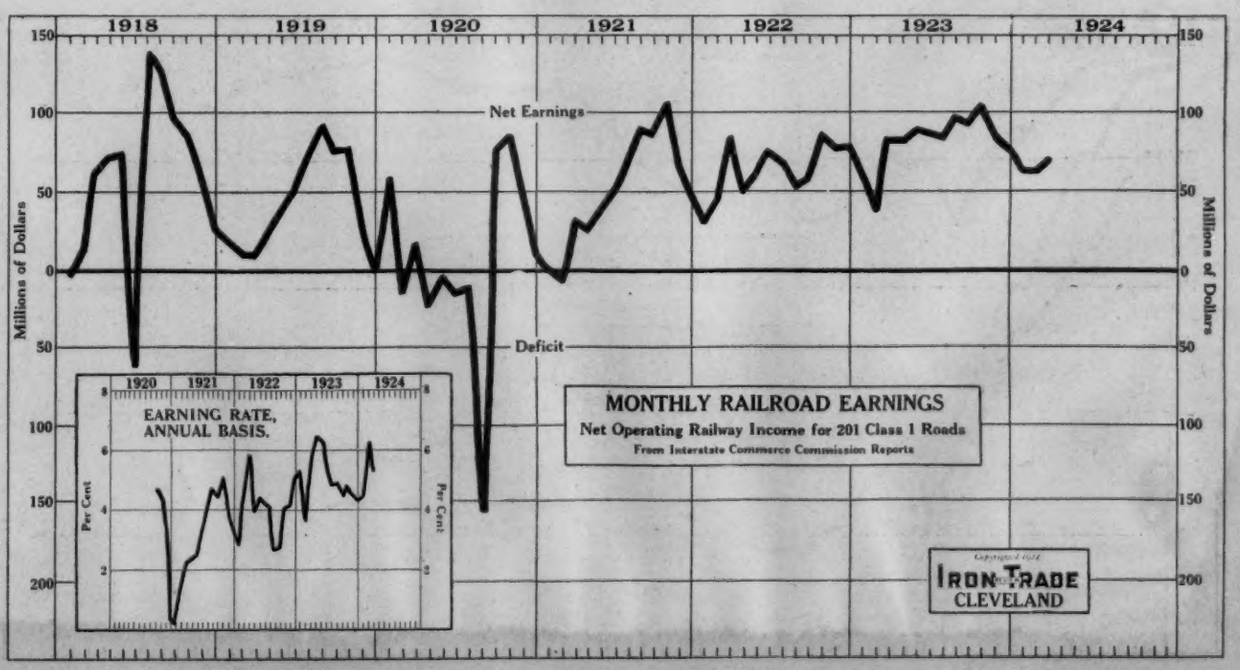


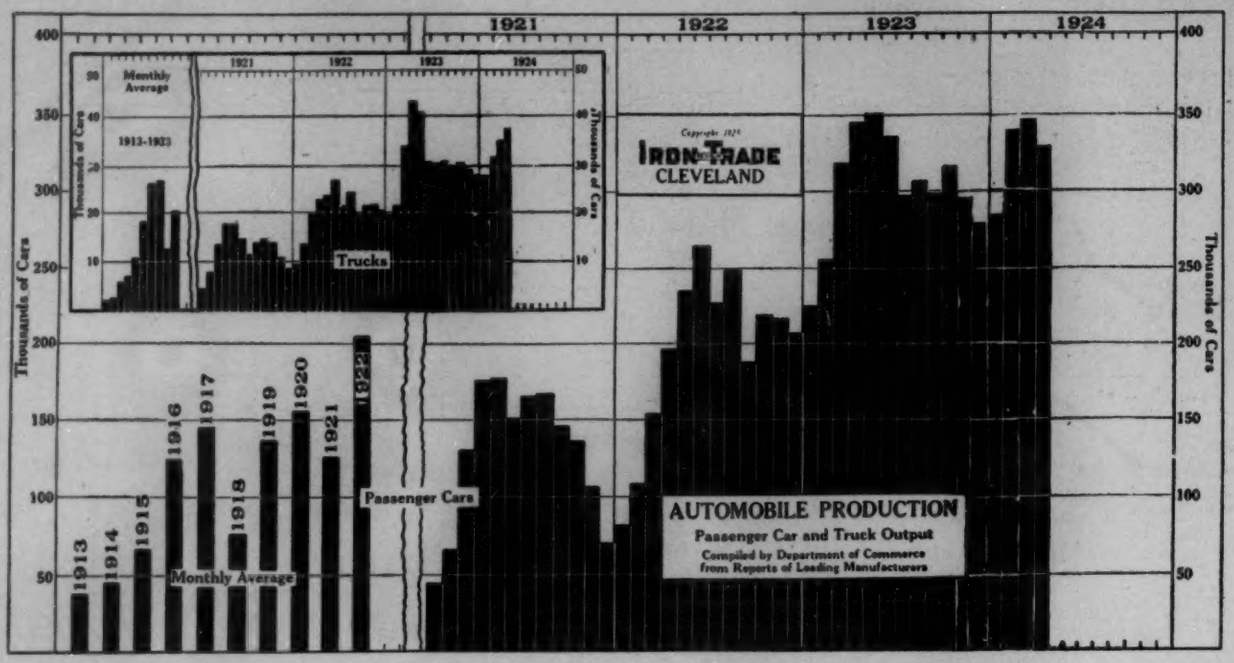
Wholesale and Retail Prices

WHOLESALE price levels, computed by the bureau of labor statistics, stand at 48 per cent above the 1914 basis. This is a drop of 7 per cent from the level of one year before. In April, the only group to advance was that of farm products. At 39 per cent above the 1913 average farm products stand even with metals and metal products. Living costs dropped nearly 1 per cent in April. The cost of living dollar, measured by 1914 standards, is now worth 62 cents against 48 cents in 1920.

Railroad Earnings

RAILROAD traffic has been running about 7 per cent below the levels of 12 months ago. The result is that net earnings of railroad companies have suffered. In March, net earnings of Class 1 roads amounted to $80,200,000 compared with $84,000,000 in March, 1923. The rate of return on estimated property valuation was 5.31 per cent against 5.84 per cent one year before. Railroads are retrenching their expenditures for improvements and equipment. Some are adopting the 5-day week for their shops for economy.



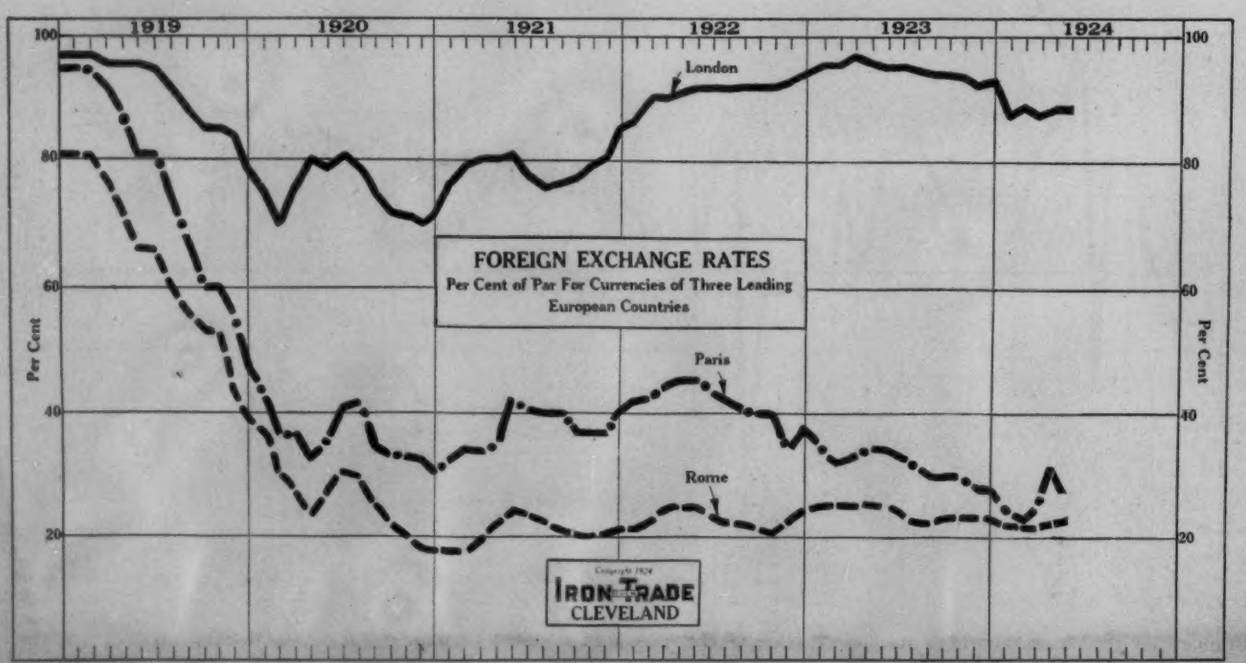


Automobile Production

APRIL automobile production amounted to 373,139 passenger cars and trucks. This was a decline of 2½ per cent from both the preceding month and from April, 1923. Passenger car production declined from March while truck output gained. Output for the first four months of 1,439,343 cars exceeded that for the same period of 1923 by 14 per cent. Current retail demand is estimated at 15 per cent under one year ago. Since 1922 43 automobile companies have been eliminated from the field.

Foreign Exchange

THE outstanding movement in foreign exchange in recent weeks has been the violent fluctuations of the French franc. The franc's swift fall was checked in March by a $100,000,000 loan to Paris by American bankers, by proposed economies and higher taxes and by support in the exchange market by the Bank of France. The overturn of the Poincare government has thrown new uncertainties into the exchange market. The outlook for reparations agreement is the most favorable factor in the prospect for Europe.



Current Iron and Steel Prices of Europe

Prices Converted into Dollars at Rates of Exchange, May 26

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgian and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Ports	
Export Prices f. o. b. Ship at Port of Despatch—By Cable	£ s d			Francs		Francs	£ s d	
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$19.88	4 11 6*	$20.72	380	$18.70	400	$22.81	5 5 0
Basic	19.99	4 12 0	21.26	390	19.17	410	23.90	5 10 0
Basic-bessemer	21.73	5 0 0†	20.72	380	18.23	390	22.81	5 5 0
Hematite, Phosphorus 0.02-0.05	21.40	4 18 6	24.54	450	.....	....	24.98	5 15 0
SEMIFINISHED STEEL								
Billets	$32.59	7 10 0	$25.63	470	$25.25	540	$26.61	6 2 6
Wire rods	47.80	11 0 0	38.17	700	35.06	750	36.93	8 10 0
FINISHED STEEL								
Standard rails	$36.93	8 10 0	$31.35	575	$31.79	680	$34.76	8 0 0
Merchant bars	1.70c	8 15 0	1.38c	560	1.33c	625	1.40c	7 2 6
Structural shapes	1.63c	8 7 6	1.36c	550	1.27c	600	1.38c	7 0 0
Plates, ship, bridge and tank	1.75c	9 0 0	1.73c	700	1.54c	725	1.52c	7 15 0
Sheets, black, 24 gage	2.52c	13 0 0	2.84c	1,150	2.65c	1,250	2.86c	14 10 0
Sheets, galvanized, 24 gage, corrugated	3.27c	16 17 6	4.33c	1,750	5.15c	2,450	3.55c	18 0 0
Bands and strips	2.12c	11 0 0	2.04c	825	2.01c	950	1.87c	9 10 0
Plain wire, base	2.71c	14 0 0	2.47c	1,000	2.28c	1,075	2.07c	10 10 0
Galvanized wire, base	3.30c	17 0 0	3.21c	1,300	2.86c	1,350	2.96c	15 0 0
Wire nails, base	2.81c	14 10 0	2.60c	1,050	2.60c	1,225	2.76c	14 0 0
Tin plate, base box 108 pounds	$5.11	1 3 6	.....	....	.....	....	$6.30	1 9 0

Domestic Prices at Works or Furnace—Last Reported							Renten Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$20.10	4 12 6	$20.99	385 (2)	$18.70	400	$23.56	99
Basic pig iron	20.64	4 15 0	20.99	385 (1)	18.70	400	23.56	99
Furnace coke	5.43	1 5 0	7.74	142	8.88	190	7.62	32
Billets	34.76	8 0 0	26.44	485	25.48	545	29.75	125
Standard rails	1.75c	9 0 0	1.43c	580	1.38c	650	1.53c	142
Merchant bars	1.75c	9 0 0	1.46c	590	1.22c	575	1.56c	145
Shapes	1.84c	9 10 0	1.41c	570	1.22c	575	1.56c	145
Plates, ship, bridge and tank	1.84c	9 10 0	1.73c	700	1.51c	710	1.67c	155
Sheets, black, 24 gage	2.62c	13 10 0	2.84c	1,150	2.70c	1,275	2.58c	240
Sheets, galvanized 24 gage, corrugated	3.32c	17 2 6	4.58c	1,850	5.19c	2,450	3.76c	350
Plain wire	2.71c	14 0 0	2.47c	1,000	2.44c	1,150	2.15c	200
Bands and Strips	2.33c	12 0 0	2.04c	825	2.12c	1,000	2.10c	195

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £1 4s 0d ($5.21) f. o. b. Ferromanganese, £17 0s 0d ($73.87) f. o. b. The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

exports, on the other hand, dropped from 92,409 metric tons in February to 71,541 tons in March and the value of March pig iron exports was 37,201,000 francs or 4,383,000 francs less than in February.

Imports of iron and steel in France have dropped to the lowest figures since the beginning of the year especially as regards pig iron, which amounted to 1650 metric tons. Steel imports were 58,990 tons.

England and Continent Again Compete

European Staff Special

LONDON, May 16.—Competition in European iron and steel markets has revived especially between Great Britain, Belgium, Luxemburg and Germany. An inquiry for 5000 tons of soft bessemer steel skelp has been received in London from Australia where the material is to be made into pipe for Japan. Skelp of this grade is difficult to obtain in Europe, except perhaps in Germany, and it is probable this inquiry will also be received in America. British pig iron, principally Middlesbrough No. 3 foundry, is sold on the continent at slightly over 400 French francs ($23) per ton delivered Rouen. East Coast hematite is also sold at about 430 French francs ($25). On the other hand, Belgian No. 3 foundry pig iron 2.50 to 3 per cent silicon, at 390 Belgian francs ($19.10) f. o. b. Antwerp is competitive in England and in France; in the latter market the domestic price is about 380 French francs ($22) per ton f. o. b. furnace for the same grade French hematite prices range from 460 franks ($26.75) to 80 francs ($27.80) according to grade and source of production.

The reappearance of Belgium on export markets is due to the fact that since the beginning of the month prices in that country have been gradually shaded until they have now reached a point where they are competitive. The somewhat rapid depreciation of the franc which took place at the end of the past week has in fact brought Belgian and Luxemburg prices below sterling parity and advantage of the fact is taken by producers of both countries to snatch as many orders as possible. In France where the home market absorbs the greater part of production prices have not dropped to the same extent and little export business is being done. French billets are offered for export at 470 francs ($27.25) per metric ton f. o. b. Belgian billets are slightly cheaper at 540 Belgian francs ($26.50).

The continental price for merchant bars is now about £7 per metric ton (1.39c per pound) f. o. b. Antwerp, Rotterdam or northern sea ports Parcels of Belgian bars have been sold in the Far East and German material has made its appearance in India and China. British bars are £8 15s f. o. b. (1.70c) but for a higher grade of steel. Deliveries of British material are also somewhat more reliable and consequently British mills are still keeping a certain hold of their markets. French bars at 580 francs (1.53c) cannot meet competition from other continental makers. However mills in France are booked pretty well ahead and prices will decline only gradually according to conditions.

Rail prices are variable according to the nature of the business. An inquiry from the Tunisian railroads has been received in France for 3400 tons of standard rails and the price is expected to average 550 francs per metric ton ($32) f. o. b. mill. In Belgium the export price for rails ranges from 725 to 750 Belgian francs ($35.50 to $36.75) f.o.b. Antwerp.

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Steel Industry Pledges Itself

FOR the first time, E. H. Gary as president of the American Iron and Steel institute made public at the meeting of that body last week, the facts connected with the effort which was aimed at having the government take over the steel industry during the war. It is interesting to speculate as to what the consequences of such radical action might have been. To anyone familiar with the far-reaching scope of present-day steel production and with the exactions which must be met in successfully conducting the business, it is easy to imagine that government control or ownership might have lessened, rather than increased, the ability of the industry to function to its utmost. Certainly, those who own and operate the steel plants of the country, owe a debt of gratitude to the war-time steel committee and its chairman for persuading the representatives of the government of the ability and disposition of the steel companies to meet the situation best and with fullest effectiveness. And the steel industry as a whole is to be commended on the manner in which it carried out the important undertakings of the steel committee.

While the steel industry generally entertains the hope the country never again will be forced to go to war, it realizes that steel is one of the first and most important lines of offense and defense; and that if the United States again went to war, immediately there would come up the same question as to the ability and disposition of the steel industry to meet the national requirements. It undoubtedly was due to a desire to forestall any questions that might arise in the future that the board of directors passed the resolution which the members of the institute approved. This provides that to the extent that the United States government needs assistance for the maintenance of its military forces, the directors of the institute pledge the full support of the steel industry. In effect, the resolution is equivalent to stating that the steel industry is prepared to do its utmost to meet the country's needs and the need for its nationalization should never arise.

Putting Information To Work

INFORMATION based on business experience has a potential value far in excess of the benefit commonly derived from it. It is a safe assumption that every manufacturer has in his files data of sufficient volume and import to greatly assist him in conducting his business if he were to put it to work.

This is especially true in the machine tool industry. Practically every manufacturer assigns a serial number to each machine and attempts to keep a record of to whom it originally was sold. While the information often is not precise, it should give a fair idea of the destination of the product. In spite of the obvious value of such records as the basis of market analyses, few tool builders have utilized them for that purpose. Several companies are known to have complete data on the distribution of their machines, yet the officers have only vague ideas as to the percentage of shipments to each market division.

Under the stimulus of present competitive conditions, tool builders are giving more attention to their markets. Undoubtedly many of them are beginning to realize that better salesmanship begins with a knowledge of where to sell. This can be determined best by checking up past sales, finding out what fields have been overlooked or slighted and planning future campaigns to cover every possible outlet for their products.

In helping to direct attention to the importance of market analyses, last week's convention of the National Machine Tool Builders' association performed a real service for its members and for the industry at large.

Moral Strength Must Be Safeguarded

IF EUROPE acts promptly on the Dawes reparations report and this session of congress passes the naval building bill, which would authorize an expenditure of $120,000,000 for the construction of eight modern scout cruisers, President Coolidge is expected to call the world powers to meet in another conference to further consider limitation of naval armament. The President has indicated for some time that it would be a waste of

time and effort to call another conference on limitation of armament to supplement the treaty of 1922 until Europe has solved the German reparations question in a manner that would pave the way to general economic recovery overseas. Acceptance of the Dawes report seems to be a sturdy pivot upon which such a recovery might be based.

Authorities of the navy assert it is of the utmost importance that congress pass the bill authorizing the building of the eight additional cruisers. To some it seems a paradox to advocate the building of more cruisers and at the same time prepare for another disarmament conference. It would be of little avail, however, for the United States at this time to invite the world powers to sit in an armament conference if the American nation would not have a basis on which to make a deal around the council table. Great Britain and Japan far exceeded the United States in the matter of cruiser strength. The former nation has 50 cruisers built or under construction, while Japan has 28. The United States has only 10.

The proposed limitation conference would go to work on the basis of establishing limits and rights concerning subsurface and surface craft of 10,000 tons displacement and less. The 1922 limitation conference worked out a treaty in consideration of capital ships and not smaller vessels.

Publication of the report of Secretary of the Navy Wilbur, which sets forth that the naval ratio, instead of 5-5-3, has become 5-4-3, with the United States represented by the "4," brings home a realization that this country has allowed its naval strength to drift even beyond the contemplations of the Washington treaty of two years ago. Common prudence demands that steps should be taken to correct the defects brought out by Secretary Wilbur. The capital warships strength of the United States likely would be further cut if this country were not to be allowed to convert some of its capital ships into oil burners and to elevate the gun turrets of battleships.

Gold Basis Urged for German Bank

NO PROBLEM connected with the Dawes plan is of more vital concern in this country than that involved in determining the basis of exchange for the new proposed German bank of issue. The choice lies between the American dollar and the British pound sterling. If the German bank adopts the dollar as its parity of exchange in its dealings in international finance it will be equivalent to accepting the gold basis.

On the other hand, if the British sterling is adopted it will mean that the German bank is sinking its foundations into the shifting sands of a depreciated paper currency. That would be to invite a return of the evils of a fluctuating exchange for Germany.

The fight for a stable gold basis for the German bank was first started in this country by Col. L. P. Ayres, vice president of the Cleveland Trust Co., and one of the expert advisers of the Dawes-McKenna committees. Colonel Ayres has urged upon American bankers and investors with great earnestness the importance of demanding the gold or dollar basis, for the German bank as one of the conditions of the proposed $100,000,000 loan to Germany by America.

The cudgels of this fight have been taken up by the advisory council of the federal reserve board. The recent recommendations of the council have aroused a storm of international controversy upon the question. Some observers have described the issue as a struggle for world supremacy between the dollar and the pound. As a matter of fact, it is no such thing. It is really an effort by this country to lead Europe out of the quicksands of paper finance back to the safe rocks of a gold basis. Says the advisory council of the reserve board:

"The Dawes report provides for a German note-issuing bank on a gold basis, but leaves the door open to put it on a sterling basis. In the opinion of the council the sooner Germany can be placed on a gold basis or gold-exchange basis, the sooner can England, and other countries also, return to an unrestricted gold basis, while if Germany were placed on a sterling basis, the world must prepare itself to remain on a basis of exchange instability for a prolonged period, the end of which cannot be foreseen."

The council strongly urges that the federal reserve board encourage the adoption of the gold basis for the new German bank by taking necessary steps to facilitate the rediscounting in this country of properly protected German gold bills. By this means the United States could place its vast surplus hoard of gold at the disposal of Europe, whence it came, and where it is so urgently needed at this time.

Much of Europe's postwar suffering has flown from an instable fluctuating currency. It would seem that she would snap at the opportunity to utilize America's gold stores as a means of quieting her jumping financial nerves. But powerful European banking interests profit from the gyrating exchange rates.

Moreover, London would profit from the immense reparations financial clearances if the sterling basis of exchange were chosen. In the farflung and complex game of international finance, however, the advantage is all with the United States, because she has more than one-half the monetary gold stocks of the world. The dollar will reign supreme until other currencies achieve a parity with gold. It is important to world stability that that day be speeded. The start should be made with the new German bank.

Good Government, Gary's Plea

President of Institute Discusses Affairs at Washington and in Business World—Deplores Some Actions of Congress, Praises Coolidge as Representing Sound Doctrines—Argument for Maintaining Present Wages Applauded

DESPITE the fact that conditions at Washington have not been satisfactory, Judge E. H. Gary declared at the general meeting of the American iron and Steel institute, New York, May 23, that primary elections have shown President Coolidge has widespread approval for his conduct in office. If the present disposition of congress continues indefinitely, he stated, the inevitable result must be financial and industrial decay. But the growing disapproval of the people generally of the actions of congress is a favorable sign. Tremendous and long-continued applause greeted Judge Gary's exhortation of the steel industry to uphold "that great and good man who at the present time honors us by being President of the United States."

A remarkable feature of the meeting was the address of Judge Gary at the morning session. For the first time, he opened the meeting without a prepared paper. He spoke extemporaneously, for just 10 minutes short of two hours, and he showed unusual vigor. The greater portion of his address was in the nature of a description of his recent trip to South America. He then followed with a discussion of business conditions.

Chairman Talks on Trade and Politics

THAT the general sentiment of the steel industry is opposed to a reduction in wages was indicated by the hearty applause which greeted Judge Gary's remarks on this subject. His comment on current conditions affecting business was as follows:

"To say that business is entirely satisfactory would be offending my sense of truth and propriety. To say that we are not producing as much as we would like or more than three-fifths of what we were producing when we were at the heighth, is only stating what you know to be an obvious fact.

"I would not be exaggerating if I should say to you that conditions in Washington have not been satisfactory. I have on more than one occasion hinted at conditions there and have deplored some of the action which has been taken. I have nothing to say against any individual congressman. I fear that some of them have not been inspired by motives which are conducive to the best interests of the people of this country.

"I suspect politics have entered into the discussions to a degree that is unjustified from the standpoint of good reason or good morals. But those who have been guilty of any impropriety, or of the exercise of their rights from bad or unworthy motives, must take the responsibility. Some of them talk as though they would like to secure votes by leading a portion, perhaps a substantial portion, of the people of this country, who have less in resources than others, to believe that they have been unjustly treated; to believe that they have not received their due proportion of the results of commerce and industry; and that if the speaker shall be elected or shall be retained in his present position, he will bring about something that will secure to these people who are possessed of less resources a position where they will be on a par and on an equality with others who have by economy and industry and good management been able to save something for themselves. But they do not say what goes with it, from the standpoint of good logic or common decency; that if property or money or proceeds of activity are taken from a man who has saved what he has earned, without justice and without reason, they will soon get to a point where all the people including those who have little will have less, because prosperity will cease to exist and we shall be driven or shall drift into a position of industrial decay.

"They overlook, purposely or otherwise, the fact that the people of this country, taken as a whole, must stand or fall together; that if the country prospers, every one shall have the opportunity to prosper; if it does not prosper, that no one will have any chance for success. Sooner or later people will find out by the stern facts that such is the case.

"In our institute are represented both sides, those who produce and sell and those who produce and consume. This is at a time, as always, when there is such agitation as will likely bring about a depression in business and the purchasers, if they have the right, are inclined to bring about a decrease in prices if they possibly can. The purchaser has the right in every honest way to secure low prices if he can, as the producer has the right in every honest way and up to a reasonable and fair point to secure larger prices. But I want to say to the consumer and to the producer alike that if by selfishness either side assists in bringing about conditions which benefit one and prejudice the other, the final result will be disastrous to both. There can be no escape from that conclusion. And you producers who are asked to sell for lower prices than you are justly entitled to, you have a perfect answer when you say to the consumer, you are just as much interested in your business, in what you do with the steel which you purchase, in the maintenance of fair and reasonable prices as the other side, the man or the institution from which you purchase. They must both go together.

"I do not object to fair prices, reduction of prices when they are too high. I do not object to any kind of governmental control or supervision which prevents imposition, which prevents a condition calculated to secure a monopoly or to enable the producer to impose upon the consumer. But when that is done it must be done by an impartial competent authority, unprejudiced, unselfish and representing the government itself. I do not object to the consumer arguing to the best of his ability for lower prices if he thinks it is for his interest and the interest of the country to have them lowered, if he thinks they are unreaseanably high, when the high costs of production are taken into account. But I beg of him to remember, as I do both sides to remember, that there are others who are involved in the consideration of this question.

"First of all, there is the wage earner himself. Just now there is some talk of reducing wage rates. Some reductions have been made. The air is filled with suggestions that others will be made. I have nothing to say to another man in regard to that. He knows his own business and own ability better than I do. But let all of us remember that the costs of living are high.

"In that respect the public not engaged in certain lines has been imposed upon by the cupidity and the greed of some who on account of particular circumstances have an opportunity to oppress. Some rates are entirely out of line and fully unjustified. The costs of living are high, and so far as we can, let us keep the wages high enough to give the man a good and reasonable support.

"I am glad you loudly and vociferously applaud that sentiment. Let us so far as the steel industry is concerned always do about the right thing. Let us be just to everyone, even though we are not treated fairly by governmental authorities, by congressional representatives or even by some parts of labor.

"Now this country is not going into the hands of a receiver. There is a bright future for us. We are too rich, too strong; the necessary demand for our products is too great to permit the

country for long to go without buying liberally of what we produce. We will get our fair share of business. Let us do what we can to continue prosperity. Let us do what we can to hold up the hand of that great and good man who at the present time honors us by being President of the United States.

"The long continued applause indicates how you feel toward President Coolidge, not because he is a republican, not because a republican is any better than a democrat, for after all it is a question of what the man is, not what party he belongs to; but because he stands on the moral principles which alone make a country strong and vigorous and worthy of the high opinions of the people of this country and of all other countries. What a remarkable thing it is that during the last few weeks whenever there has been a primary election, the name of President Coolidge has secured the almost unanimous approval of those who voted. It means that at this time we happen to have a man who never regards himself or his own interests when deciding or acting upon any material question that is presented. He looks to the best interests of his country. He would sacrifice himself and his chances if by so doing he believed he benefited the people as a whole. It is because he stands for moral principles, for honesty and integrity and frankness. And entertaining those sentiments, naturally he can afford to be courageous and outspoken and bold and invincible. And with him he has associates in his cabinet who are of the very highest order of intelligence and morals.

"Let us take advantage of the disposition shown in Washington by those who have proved their integrity and their fairness, by being liberally fair on our part. Let us never intentionally do or say anything that is opposed to the public interest. Let us never fail to respond to any invitation on the part of the people in Washington to furnish information and to guide our footsteps or to direct our thoughts and our language in favor of justice and propriety, the observance of the laws and, above everything else, the observance of the principles of right and eternal justice."

Judge Gary sat in the audience during the remainder of the morning session, which was presided over by John A. Topping. Walther Mathesius, superintendent of blast furnaces, Illinois Steel Co., South Chicago, delivered a paper on uniform coking coal which is presented elsewhere in this issue of IRON TRADE REVIEW. Mr. Mathesius' paper was discussed by James B. Pauley, Dering Coal Co., Chicago, and H. R. deHoll, Inland Steel Co., Indiana Harbor.

Then followed the paper on selling practices in the steel industry, by Ernest T. Weir, president of the Weirton Steel Co. The supply of copies of this paper, was exhausted early necessitating the printing of an additional number.

The remaining papers, by Commander J. B. Rhodes, Thomas T. Read, J. R. Adams, G. M. Hohl and Gordon Fox, were presented in the afternoon. The paper by Commander Rhodes was discussed by R. F. Flinterman, president of the Michigan Steel Castings Co., Detroit; John A. Mathews, Crucible Steel Co. of America, and F. E. Clark, Republic Carbon Co., Milwaukee. The paper by J. R. Adams was discussed by F. C. Elder, American Steel & Wire Co., Pittsburgh. The paper by G. M. Hohl was discussed by J. C. Barrett, blast furnace superintendent, Ohio works, Carnegie Steel Co., and N. H. Gellert, Gellert Engineering Co., Philadelphia. The paper by Gordon Fox was discussed by J. D. Wright, General Electric Co., Schenectady, and E. Friedlander, Edgar Thomson works, Carnegie Steel Co.

Judge Gary read his formal paper at the banquet in the evening. This paper constituted a permanent record of the facts as to how the steel executives blocked the effort to nationalize the steel industry during the war. Attendance at the banquet numbered 1300, a few hundred less than the attendance during the day. Following Judge Gary's paper, Axel Fredik Wahlberg, chief technical advisor of the Jernkontoret, Sweden, said that in many ways Sweden came out of the war almost whole, and that the exchange has been practically at par right along, indicating a fair degree of stability. The difficulties experienced by Swedish ironmasters since the war have been due largely to the extent to which the industry was over-expanded during the conflict.

Donald MacKinnon, commissioner for the commonwealth of Australia, told of the comparatively large extent to which Australia obtains its steel in the United States. He said Australia will continue to buy heavily, and pointed out that country now has only 26,000 miles of railway. Ambassador Pueyrredon, of Argentina, spoke on the friendly relations between his country and the United States and asked for full co-operation.

At the morning session, the members of the institute approved a resolution recently passed by the board of directors. This provides that, to the extent the United States government needs assistance for the maintenance of its military forces, the directors of the institute pledge the full support of the steel industry.

Use European Steel

Washington, May 27.—Large quantities of steel for buildings being erected during the present building boom in Argentina are coming from Europe, particularly Belgium and Germany. The high dollar exchange makes American prices prohibitive, according to consular reports to the department of commerce. The steel received in the Argentine is being fabricated at plants at Buenos Aires. American wire, tin plate and galvanized iron sell readily.

Harvester Company Has Better Earnings

Some betterment in the agricultural implement industry is reflected in the annual report of the International Harvester Co., just made public. Profits for the year were nearly double those for 1922. Net profit for 1923, after charges and taxes, was $10,274,376. After paying dividends of $5 on common stock there was a surplus of $1,064,868, but this was more than absorbed by a 2 per cent stock dividend which amounted to $1,958,368. The result was a reduction of $893,500 in total surplus which now stands at $51,308,173. Net profits in 1922 were $5,540,768. The comparative income account follows:

	1923	1922
Operating income	$18,237,836	$11,417,484
Interest on loans	767,193	916,812
Ore and timber depletement	560,693	330,021
Plant depreciation	4,138,492	3,455,602
Special maintenance	333,204	183,773
Provision for losses on receivables	2,163,874	990,508
Net profits	10,274,376	5,540,768
Preferred dividends	4,215,673	4,215,673
Common dividends	4,993,833	4,847,920
Surplus	1,064,868	*3,522,825

*Deficit

"For the first time in three years domestic business resulted in a small profit," said President Alexander Legge. "Over half the total business represented sales in foreign countries and products other than farm equipment. The foreign trade prospect indicates a further gain.

"The year 1923, while far from normal, showed some improvement over the preceding year. There is still a great disparity between the prices the American farmer receives for his produce and the prices he must pay for manufactured articles. Until this spread is reduced the agricultural implement industry cannot expect a return to normal conditions."

Hurley Machine Net Up

Hurley Machine Co., Chicago, showed the largest profits in its history in 1923. After allowing for all deductions, there was a balance of $959,014 for dividends. In 1922, the company reported a balance of $635,941. The nearest approach to the figures for 1923 was in 1920, when a net of $706,664 was shown. Net sales for 1923 totaled $6,855,088, as against $4,857,464 in the previous year, being exceeded only by 1920, when the total business amounted to $8,828,024. After dividends and sinking fund requirements, $373,462 was carried to the surplus account last year.

At the Brooklyn N. Y., industrial conference, April 15, Brooklyn was mentioned as the "fourth industrial city in the United States." Various phases of industry in Brooklyn were discussed.

Steel Industry Escaped Peril

Government Officials Planned To Nationalize Business During War—Owners' Insistence on Management, While Serving Efficiently, Avoided Critical Situation—Record Is Made Clear

BY E. H. GARY

THE greatest and most destructive of all wars, to be known as the World war of 1914-18, had been raging for more than two and one-half years with extraordinary and surprising success to the central powers, when the congress of the United States, with practical unanimity, endorsed the declaration of the President that the time had arrived for our government to mobilize all the military forces and facilities of the country and to utilize them in supporting the allied armies of the eastern hemisphere in their contest for the defense and preservation of civilization. Conditions were critical and possible results to the whole world uncertain.

Soon after the United States entered the war, Bernard Baruch, by appointment and at the direction of the council of National Defense, called upon the president of the American Iron and Steel institute and requested him to act as chairman and to organize a committee of iron and steel masters to represent and to mobilize the iron and steel industry of the United States in co-operating with the Council of National Defense in supplying and utilizing the iron and steel necessary for war purposes up to the full limit of productive capacity. This request was fortified by letters from the secretary of war and the secretary of the navy.

In accordance with the request, the committee was immediately organized, established subcommittees, commenced active operations, met frequently and remained in office until after the armistice was signed. At first it was designated as a part of the Council of National Defense, but a little later, because of legal questions which were raised, the committee was dissolved, and, at the instance of the government, its members were promptly organized into a new, independent committee representing only the iron and steel industry of the country.

How much hard work was done by the general committee and by subcommittees need not be detailed. A large part of the hard work was performed by the committee on distribution, composed of James A. Farrell, E. A. S. Clarke and J. A. Topping, and their skill, patience, fairness and success are deserving of the highest praise and most generous commendation.

Still later, the war industries board was organized by and for the government, and its meetings were held in Washington. This board had charge for the government of many questions, including allocations, production, distribution and especially, because most important, the fixing of selling prices for commodities included. It was this board with whom the general committee of the steel interests usually had contact, discussion and arrangement concerning the steel sold to the government for war use.

In the earlier months there were different men at short periods acting as chairman of the war industries board, all good men, but finally Mr. Baruch became permanent chairman of the board, with Robert S. Brookings permanent chairman of the price fixing committee, and J. Leonard Replogle, director of steel supply. There were other subcommittees, but not so active concerning the steel business. The number on the war industries board was large and their names are well known. They were able, fair and conscientious.

It is only fair to say that, after a long experience with the war industries board, all in all the steel committee could not, nor had any inclination to, challenge the wisdom, fairness and intentions of this board, from Mr. Baruch down. We did not always agree with them. Quite the contrary. Some of us thought at the time some decisions were wrong and unjust, but considering everything, we now believe they were justified in their conclusions.

Prices on all iron and steel commodities were fixed about every three months.

The general committee stood for what its members believed was fair, no more and no less. At some meetings of the entire industry there were many manufacturers who seemed to think the steel committee was not reasonable in respect to giving advice, particularly toward producers whose costs were high. In several such cases certain members of the steel committee purchased from the complaining producer and personally paid for his or its commodity at prices materially larger than the government prices.

The difficulties surrounding the steel committee were not ended with the adjournments of the large meetings of the steel industrials. The subject matter was referred with power to the committee for action, and composing this committee were 10 members. They were hardly ever entirely in accord at the beginning. There were many discussions and occasionally wide differences. Often decisions were not reached in time to meet the War Industries board in Washington, as notified, and further time to consider and report was asked and granted. More than once, the general committee, without having agreed, met the industries board, and different

What Steel Did For Government

THE iron and steel industry would not like to go through another war, but if it became necessary, would again offer its services and its facilities in defense of home and country. By resolution of the institute, lately adopted, it is pledged to do this.

What did the iron and steel industry do or furnish to the United States government and its associates for military purposes during the late war?

A single industrial concern of this country furnished for the military necessities of the United States and associates in the war, finished steel aggregating approximately 18,500,000, *tons valued at* $1,400,000,000. *It purchased government Liberty and Victory loan issues amounting to about* $112,000,000; *expended for extensions to producing plants and other property in order to enable it to meet the demands for steel and proprietary products a total of about* $350,000,000. *We rightly assume that other business concerns engaged in the same line of industry together supplied steel to relatively the same extent and made proportionate expenditures and investments; and therefore there was furnished by the industry as a whole at least* 35,000,000 *tons of steel of a value of* $2,600,000,000, *and an outlay for expenditures and investments of* $750,000,000 *or more.—E. H. GARY.*

Abstract of address delivered by president of American Iron and Steel institute, at banquet of institute, New York, May 23.

schedules were presented and discussed. In such cases the industries board had to adjust the existing differences. Having said this much, only for the purpose of hinting at the difficulties which perplexed the steel committee, it is proper to say that there is no good ground for finding fault with any member of the committee. All were fair, well-intentioned and intelligent. Perhaps everyone was right from his own viewpoint. There was never any ill-feeling among the members of the general committee. The chairman has reason to be grateful for the splendid assistance rendered by every other member of the committee.

Nor did the members of the war industries board always agree at the start, judging by their remarks and discussions. They had their troubles. However, at the end of every hearing, after much discussion, wide differences, consideration of what seemed insurmountable obstacles, both sides, the board and the general steel committee, unanimously agreed upon prices for three months, and the President approved and published the prices fixed. This also was largely influenced by a spirit of patriotism.

As to profits based on these prices, they were nil in some cases, small in many cases, substantial in other cases and liberal in a few. This was because the only practical and legal thing to do was to fix one price for each commodity, and as no two producers had exactly the same costs, these difficulties were overcome, so far as practicable, by discriminations concerning allotments, by accommodating so far as possible the higher cost mills, and by assumption of certain burdens by those who were better able financially to carry them, and by purchases, as already mentioned.

Without any demand or request from the government or from the workmen, it increased the wage rates from time to time, commencing with an average daily earnings per employe of about $2.85 in 1914, until they amounted to an average of $6.20 in December, 1918, an increase of 116 per cent.

It furnished to the government, without charge or recompense, large numbers of experts in various lines of the nation's military activities.

It extended its capacity to produce finished steel products by about 10,000,000 tons, in many cases for works that could not be utilized in times of peace and therefore were nearly a total loss.

It never refused nor neglected to honor any requisition of the government for any expenditures deemed essential to carrying on the war.

It expended for experimentation millions of dollars in order to assist the government in its endeavor to perfect its facilities for military defense.

It never failed to make deliveries of steel or finished products demanded for war purposes and, on the contrary, met every demand, and without any delay that was injurious to the government or materially interfered with its war program.

In every respect it gave its unlimited, unqualified support to the government and its associates in their military campaigns up to the full measure of the capacity which it possessed at the beginning or could secure by prompt and efficient effort and expenditure. And everything it did was done cheerfully and promptly.

Tells of Industry's Patriotism

AS THE result of frequent representative steel meetings during the war, it is believed that, without exception, it was, before final adjournment of each meeting, unanimously resolved that the whole subject matter be submitted with full power to the general committee. This was not only creditable, it was astonishing, for arguments in favor of prices lower than some that were demanded were made by members of this general steel committee. Among the arguments advanced by those who advocated the lower prices, the most telling and convincing related to patriotism, love of country and duty.

Not a man in the whole steel industry who attended the meetings ever did or ever could ignore or resist the influence of appeals to his spirit of loyalty. Looking back to these meetings of excitement, sometimes of apparent temper, deep-seated and well expressed sentiments of dissatisfaction and injured feelings, allow your president to say that the grandest and most satisfying experiences in his life were to see large numbers of steel magnates stand upon their feet again and again as an expression of assent to resolutions in favor of subordinating personal interest to the public weal. All credit and honor to these men.—E. H. GARY.

At one of the meetings in Washington, probably during the fall of 1917 or the early part of 1918, it was stated by Mr. Willard, the then acting chairman of the war industries board, that the government was seriously considering the desirability of taking over the control and management of the total iron and steel industry of the United States as a guaranty of full production and distribution. This provoked expressions of surprise and objection, whereupon Mr. Willard, for his board, promised that before action of this kind should be decided upon, the steel committee would be duly notified and given a full hearing. Subsequently the steel committee received notice to appear before the board in Washington, for consideration and decision of the subject of taking over the iron and steel business.

The committee appeared and a somewhat lengthy discussion took place. Several members of the board argued in favor, and members of the steel committee against. The chairman, with earnestness and considerable feeling, though with no show of anger, spoke at length. Perhaps the same is true of other members of the committee. After referring, considerably in detail, to what the steel industry, under existing management, had done and was doing toward supplying steel for the military necessities of the United States and its associates, the argument of the chairman of the committee closed with substantially these words:

"If you think, under government management, better service will be rendered and you believe you can legally do it, you may undertake to forcibly secure the management of the steel business. You will never do it with the consent or approval of the owners of these properties and you will be held responsible, morally at least."

Mr. Baruch at this time was chairman of the board and through Mr Brookings, who had never advocated the proposed procedure, the board then took the matter to the President, who, after reading the proceedings written up, decided to let the matter rest temporarily at least. The subject was never again broached to the steel committee.

It has been reported that the secretary of the treasury had urged the President to take over the steel industry, though the steel committee does not claim to have knowledge of this action on the part of the secretary. It is believed that the war industries board or the Council of National Defense did not originate or advocate the proposed governmental management. That the President was urged by some one and was partly committed to the scheme, and that the war industries board was honestly advocating the course suggested under instructions from the President, there can be little doubt. Imagine what would have been the consequences if the steel business had been taken over. It is believed this, together with certain labor qustions, not including rates of compensation, were the only serious matters concerning which the steel industry was opposed to requests made by any governmental agency during the war.

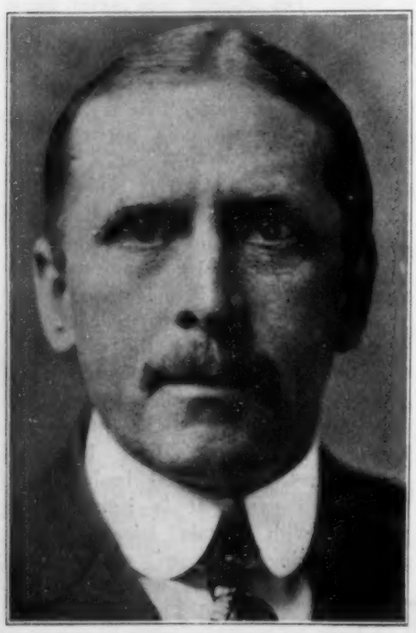
Institute Speakers Cover Diversified Subjects

G. M. HOHL

GORDON FOX was graduated from the University of Wisconsin in 1908 with the degree of bachelor of electrical engineering. From 1908 to 1913 he was connected with the Northern Works at Madison, Wis., and the plant at Fort Wayne, Ind., of the General Electric Co. From 1914 to 1916 Mr. Fox was at the Evanston works, of the Mark Mfg. Co. where he was connected with the developement of a machine for electric welding of the longitudinal seam of butt weld pipe. During that time Mr. Fox invented and developed a method for welding brass seats into cold drawn steel unions. He was electrical engineer for the Steel & Tube Co. of America, Indiana Harbor, Ind., from 1916 to 1920, during the period of construction and initial operation. From that time on Mr. Fox has been electrical engineer for Freyn, Brassert & Co., Chicago. He has been a frequent contributor to the technical press and is a member of the American Institute of Electrical Engineers, Association of Iron and Steel Electrical Engineers and the Western Society of Engineers.

WALTHER MATHESIUS, superintendent of blast furnaces, South Works, Illinois Steel Co., South Chicago, Ill., became connected with the steel industry in 1904, holding various operating positions from that date to 1906 with several blast furnace plants in Germany. In 1906 he attended the Technical University of Berlin, specializing in ferrous metallurgy. He obtained his master's degree in 1910. In 1911 he was awarded a doctor's degree, his treatise being on "Magnetic Properties of Manganese and Nickel Steels." That year he came to the United States and entered the research department of American Steel & Wire Co. at Worcester, Mass. From 1912 to 1915 he was assistant superintendent of blast furnaces at the South Works of the Illinois Steel Co., being promoted to his present position in 1917.

WALTHER MATHESIUS



THOMAS T. READ

GM. HOHL, superintendent of blast furnaces for the Bethlehem Steel Co., Bethlehem, Pa., was graduated from Lafayette college, Easton, Pa., in 1912. He attended the Massachusetts Institute of Technology the next year but left that institution to be with the Bethlehem Steel Co. from June 1913 to September 1914, returning then to the Massachusetts institute. Mr. Hohl returned to the Bethlehem Steel Co. in June 1915. He has been connected with the company since, with the exception of the period from December 1915 to April 1915. He was made assistant superintendent in April 1915 and in 1919 was made superintendent. He now is chairman of the blast furnace committee of the Bethlehem Steel Co.

THOMAS T. READ, acting assistant director of the United States bureau of mines, department of the interior, was born at Monmouth, N. J. He was given a master of engineering degree in 1902 and a doctor of philosophy degree in 1906 from the Columbia university school of mines. In 1904-05 he was a fellow in mining and in 1906-07 assistant in mineralogy at Columbia. For three years, Mr. Read was professor of metallurgy in Pei Yang university, Tientsin, China. From 1910 to 1915, Mr. Read was editor of *Mining and Scientific Press*, San Francisco, later becoming a metallurgical engineer for the New Jersey Zinc Co. During the war he was chief of the reviewing branch, estimates and requirements, in the army ordnance division. After the war he was in charge of the bureau of mines exhibit at the Brazilian Centennial exposition. In 1919 he became chief of the information service of the bureau of mines, Washington.

GORDON FOX

Authors' Papers Present Results of Research

COMMANDER JOHN BARCLAY RHODES, United States Navy, was born at Aston Mills, Pa., Dec. 22, 1885. He was appointed a midshipman to the United States naval academy, at Annapolis, in 1909. He saw service on various naval vessels. Just before the world war Commander Rhodes was assigned to the United States navy yard at Washington. In 1915 he served on the battle ship NEW YORK and shortly after the United States entered the war he was gunnery officer on the battleship FLORIDA, later having been assigned to the ordnance bureau at Washington. In the latter part of the war he was naval inspector of ordnance in charge of the erection and operation of the naval armor plant and naval projectile plant at Charleston, W. Va. As a reward for the services he rendered during the war, Commander Rhodes was awarded a special letter of commendation by the United States government, with a silver star.

In 1919, Commander Rhodes was in charge of the naval station at Cavite, Philippine islands and served on the naval vessel WILMINGTON. Later he was executive officer of the U. S. S. HURON and commanded several other naval vessels. Since November, 1923, he has been in charge at the naval gun factory at the Washington navy yard. Last February, he was designated as a representative of the navy department on the sectional committee of the American Society of Mechanical Engineers. Commander Rhodes has served on many United States naval vessels in various capacities.

J. B. RHODES

J. R. ADAMS, superintendent of the research department, the Midvale Co., Nicetown, Philadelphia, was graduated from the University of Pennsylvania with the degree, bachelor of chemical engineering in 1913. In 1915 he joined the Midvale company as research chemist. He was advanced to assistant superintendent of the open-hearth department of that company in 1916, which position he held until 1918 when he was appointed assistant superintendent of the research department. In 1921 Mr. Adams was appointed superintendent of the research department of the Midvale company, which position he has held up until the present time.

Institute Speakers

J. R. Adams,
Superintendent of Research,
Midvale Co.,
Nicetown, Philadelphia

Gordon Fox
Freyn, Brassert & Co.,
Chicago

G. M. Hohl,
Superintendent of Blast Furnaces,
Bethlehem Steel Co.,
Bethlehem, Pa.

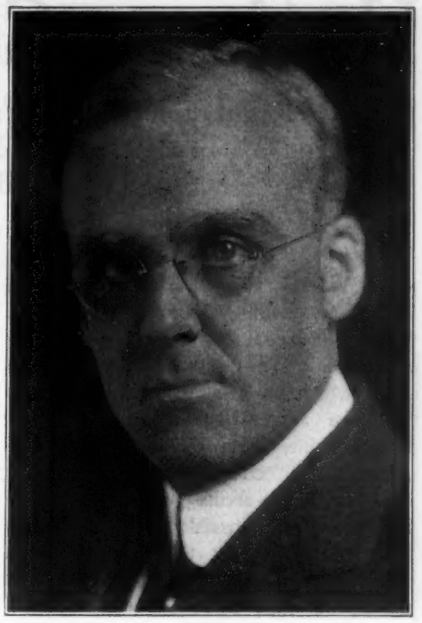
Walther Mathesius,
Superintendent of Blast Furnaces,
South Works, Illinois Steel Co.,
Chicago

Thomas T. Read,
Acting Assistant to Director
United States Bureau of Mines
Washington

Commander J. B. Rhodes,
Naval Gun Works,
Washington Navy Yard,
Washington

Ernest T. Weir,
President,
Weirton Steel Co.,
Weirton, W. Va.

ERNEST TENER WEIR, president of the Weirton Steel Co., Weirton, W. Va., was born in Pittsburgh, Aug. 1, 1875. He received his education in the schools at Pittsburgh, Clarksburg and Weirton, W. Va. When 15 years old he joined the Braddock Wire Co. A year later he became associated with the Oliver Wire Co., Pittsburgh. In 1901 he was appointed manager of the Monongahela Tin Plate mills of the American Tin Plate Co., and two years later also became manager of its mills at Monessen, Pa. In 1905 Mr. Weir, together with J. R. Phillips, organized the Phillips Sheet & Tin Plate Co., Clarksburg, W. Va., being secretary and general manager at the time of organization.



ERNEST T. WEIR

Mr. Weir was elected president of the Phillips company in 1908. He still retains the position of chief executive of the company, which in 1918 became the Weirton Steel Co. Mr. Weir is identified with many industrial organizations, being a director of the Bank of Fittsburgh; Edgewater Steel Co., Oakmont, Pa.; Hanna Ore Mining Co., Cleveland; Redstone Coal & Coke Co., Brownsville, Pa., and other companies.

The Phillips Sheet & Tin Plate Co. purchased the plant of the Jackson Sheet & Tin Plate Co. at Clarksburg, W. Va., in 1905. Additional mills were built at Holliday's cove, W. Va., and the town changed to Weirton, the present headquarters of the company.

J. R. ADAMS

Uniform Coking Coal Is Needed

Regulation of Blast Furnace Fuel in Accordance with Principles of Iron Ore Trade Suggested—Storage Facilities Would Help—Urge Analysis as Basis of Accounting for Furnace Fuel

BY WALTHER MATHESIUS

A WIDE range of irregularity is the outstanding feature of the blast furnace fuel supply at a majority of plants. The discrepancy in this respect, which so generally exists between the coke and all other raw materials is so prominent, and so vital is the betterment in the economy of blast furnace work which it seems reasonable to expect from the possible improvement in fuel regularity, that the necessity of a closer co-operation of producers and consumers of blast furnace fuel is undeniable and its accomplishment at an early date inevitable.

Figs. 1 and 2 show the fluctuations, day by day, in the average analysis of the individual component grades of coal before their combination, at the coke plants, into the finished coal mixture. Coal diagrams taken by the author indicate a greater range of variation in the carload samples than in the daily belt samples of each grade, and again more decided fluctuations in the latter than in the analyses of the coal mixture. Deducing from this apparent tendency a greater degree of regularity in the mixture would, however, be no doubt a fallacy. This must be interpreted as representing largely the leveling effect on the curves which results from including in each sample and analysis an increasing tonnage material. Taking more frequent samples and analyzing them separately would readily demonstrate this point.

Test figures obtained about a year ago through sampling the coal in the battery charging car at two hour intervals may be of interest because they are considered typical in denoting continued non-uniformity from carloads to the coal mixture. They are plotted in Fig. 3.

Sulphur Lines Parallel Coke

Aside from their irregularity an interesting feature of the curves representing analyses of coal grades is the evident tendency of the sulphur lines to parallel the ash variations. This should be emphasized in its bearing upon the corresponding analysis of coke. It is generally known that no definitely fixed relation exists between the sulphur content of the coke and that of various coals used in coke production. Coals from different fields show a considerable range of ratios between organic sulphur compounds and the pyritic forms and all of these vary widely in their behavior during the coking process.

If it may thus be considered established that major irregularities are encountered in the blast furnace fuel supply, and if it is realized that they are the rule rather than the exception today, the serious detriment which is inflicted thereby on the economy of pig iron production should be clearly apparent.

There is only one possible remedy, and that is the regulation of the blast furnace fuel supply in accordance with the principles of the iron ore trade, so that as nearly as this can be accomplished with our present knowledge and ability, every coke charge entering the individual blast furnace may within a given weight and volume convey into the process the same fuel value with the same chemical and physical characteristics.

Following the natural course of coke plant procedure, coke is loaded and shipped in the order of production. To be effective in the coke, uniformity must therefore be an established characteristic of the coal mixture. To continuously insure in this the highest possible degree of regularity by diligently handling and mixing the several coal grades is, of course, a task, for which the responsibility rests clearly with the coke plant organization. It is evident, however, that this obligation must be confined to the proper crushing and the mixing of various grades in fixed proportions, and that it is impossible at this point to take care of or attempt to compensate for irregularities of each constituent. To sample and analyze coal receipts and thereafter to grade them accordingly by handling through stock piles or bins evidently can not be contemplated at present in view of the delay to railroad equipment which it would entail and the large expenditures required for erection and operation of storage plants and handling facilities of adequate capacity.

However, practically every coke plant now is equipped with coal storage facilities. Such installations might contribute at times to economies by providing the opportunity for buying larger tonnages of coal during periods of price recessions and for taking advantage of cheaper water transportation during the summer season, but their principal function is the maintenance of an emergency supply to guard against contingencies which might interfere with the continuous operation of the plant. From this angle, coal storage plants are usually considered a necessary evil, representing in normal times an idle investment.

Storage May be Advantage

Yet it appears feasible to convert these storage plants into valuable assets to the industry by arranging them so as to permit of simultaneous stocking and recovering and by thus passing the entire current coal requirements of the coke plant continuously through the stock piles. In this way the necessity of periodically having to use aged and deteriorated coal would be avoided, but at the same time tangible advantages would accrue to the coke plant by making it in a large measure independent of prompt railroad delivery and continuous unloading of coal, saving demurrage bills through the opportunity for quickly handling excess shipments and preventing interference with coke oven operation, such as might result from inability to unload coal at the required rate during periods of adverse weather or of labor shortage. This development is not purely theory but has been demonstrated to the author's knowledge through the successful practice of at least one well known concern.

However, methods for handling and storing ore at the point of consumption can in no way become substitutes for the mining and grading control. Likewise, efforts of the coke oven operator and possible improvements in his plant facilities do not detract in the least from the necessity of commanding uniformity in coal shipments.

To insure this is the obligation of the coal producer. He must be convinced that the attainment of best ultimate results depends upon the establishment and maintenance by him of an adequate mining and shipping system and that this is feasible.

The coal producers might be considered as divided into two groups, those selling their output on the open market and those who, more closely affiliated with consuming interests, are furnishing coking coal to certain consumers exclusively. Under otherwise comparative conditions the former class, because of trade competition, is more directly confronted with the necessity of guarding the quality of

From a paper presented at the spring meeting of the American Iron and Steel institute, New York, May 23. The author is superintendent of blast furnaces, Illinois Steel Co., South Chicago, Ill.

their product to the satisfaction of their customers, in order to maintain their market and to enhance the sales value of their product.

For the associated companies, the principal factor serving as a sole index to mine efficiency is only too often the cost per ton mined. Efforts toward cleaner mining, through increase in labor expended and reduction in tonnage shipped, must however, necessarily increase the mine cost per ton. And it seems obviously unfair to expect the mine manager's consent to an increase in their operating cost by which their own efforts are chiefly and commonly judged, unless other equivalent opportunities be given for appropriate recognition of their services.

Basing Accounts on Analyses

In the author's opinion, the required remedy consists in applying to the mining company's cost sheets the same principle which is embodied in the docking schedules for the individual miner. In other words, it is suggested that coking coal shipments be accounted for on the basis of a fixed ash percentage, agreed upon for each grade of coal handled, and that penalties be attached for higher ash as well as irregularities beyond a definite range, and premiums granted for lower ash content by subtracting or adding tonnage as credited to the mine. It is believed that this accounting tonnage could represent an equitable measure for value received by the consumer and at the same time for the efforts of the mining organization toward producing from its coal acreage a maximum output of the highest grade fuel aiming at best ultimate economy rather than merely lowest cost per ton of material brought to the surface. Co-ordinating in this manner the interests of the mine management with those of the individual miner should produce the desired end.

For the reduction of ash and the insuring of greater uniformity, considerable work has been done in the development of mechanical coal cleaning plants. The blast furnace man should welcome such equipment, provided that by its means an improvement in coal quality can be obtained at a cost commensurate with the attendant increase in value and provided further that the installation be of ample capacity and reliability to insure the continuous treatment of the entire mine production and not only of perhaps a variable part of it. In the latter case a possible decrease in the average ash content of the monthly shipments might be accompanied by a decided increase in the range of variation, which through its detrimental effect on blast furnace practice might easily offset the advantage of the lower ash. Calculations to prove the financial justification of installing and operating coal cleaning plants on the basis of an expected reduction in the average ash content should carefully consider this possibility.

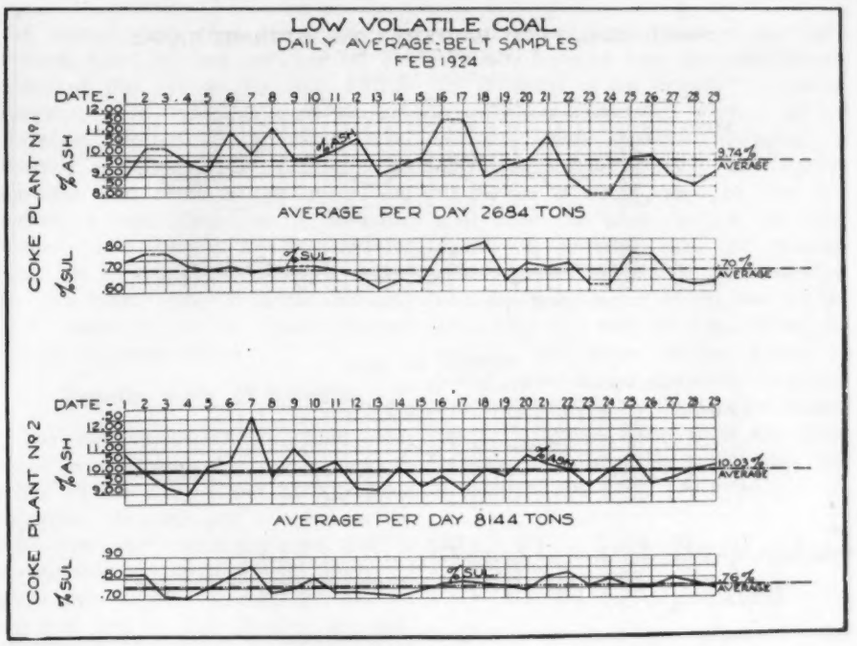


FIG. 1—DAILY AVERAGE ANALYSIS OF LOW-VOLATILE COAL

Another factor of importance which is sometimes lost sight of is the extent to which the ash content of the coal as actually shipped is above the ash percentage which would be obtained from the same coal seam by careful mining. It is evidently the latter figure which should be used as a basis in the discussion of plans for mechanical coal cleaning together with corresponding data on the degree of irregularity which might still be evident in the coal mined under these conditions.

To obtain better coking coal from the mine the intelligent and willing co-operation of the coal consumer is absolutely necessary. He should come to realize that his usual attempts to exert some pressure on the producer through the occasional rejection of particularly bad lots of coal cannot be generally effective, even though they should bring about an improvement at times and for a certain contract. The loss of revenue suffered through such procedure by the producer, including demurrage charges, rerouting, rehandling and price concessions must eventually be borne by the consumer. Particularly in the case of coal shipments from mines to affiliated coke plants and blast furnaces, the futility of such procedure will be apparent without further comment.

It may be confidently expected that a vastly more satisfactory arrangement

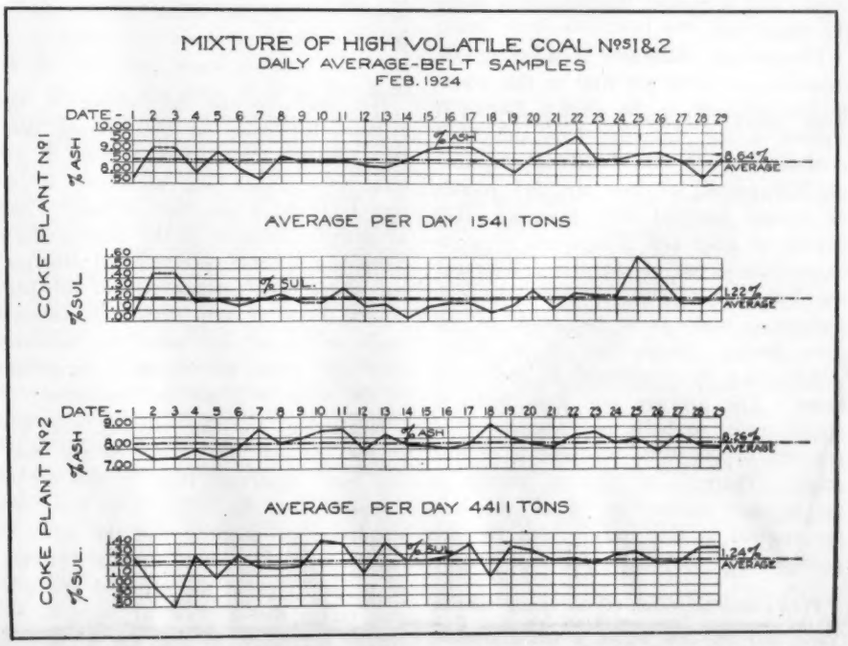


FIG. 2—DAILY AVERAGE ANALYSIS OF HIGH-VOLATILE COAL MIXTURE

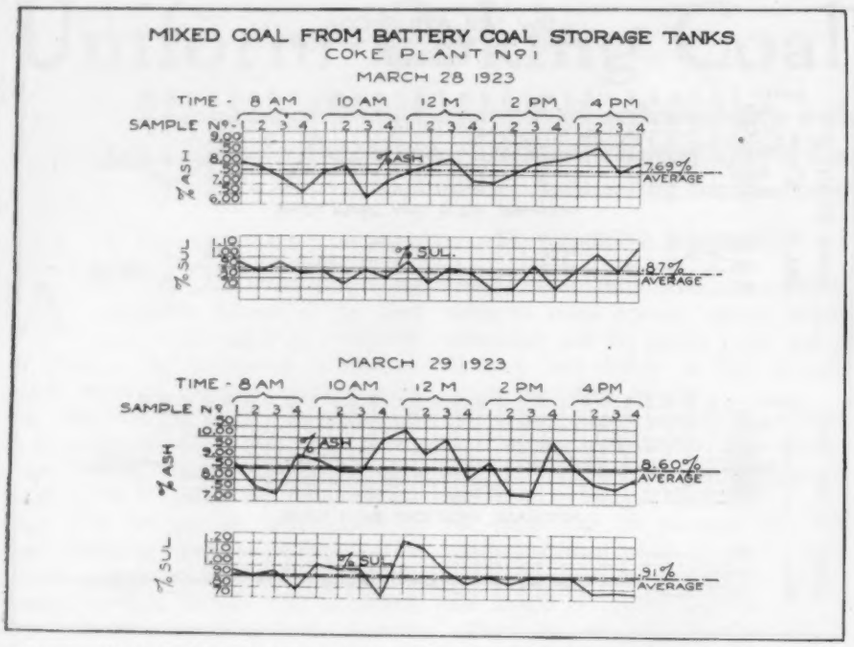

MIXED COAL FROM BATTERY COAL STORAGE TANKS
COKE PLANT N91
MARCH 28 1923
TIME - 8 AM 10 AM 12 M 2 PM 4 PM
SAMPLE Nº- 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
% ASH
% ASH
7.69% AVERAGE
% SUL
% SUL
.87% AVERAGE
MARCH 29 1923
TIME - 8 AM 10 AM 12 M 2 PM 4 PM
SAMPLE Nº 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
% ASH
% ASH
8.60% AVERAGE
% SUL
% SUL
.91% AVERAGE

FIG. 3—ANALYSES OF COAL FROM BATTERY CHARGING CAR SHOWING NON-UNIFORMITY FROM CARLOADS TO COAL MIXTURE

would result from the adoption of the proposed plan to adjust coal prices, or tonnages credited, on an analysis basis and in proportion to the fitness of the deliveries for their intended use; intelligent arrangement of sliding scales should profitably promote the changes for better coal and greater constancy of grade.

Austrian Output Higher

Production in March by the Alpine Montangesellschaft Austria was 156,000 metric tons, with 151,409 tons in February, which latter figure represents a decrease from the January level of about 12 per cent. The department of commerce is informed that the output for March was distributed as follows among the various items: Iron ore, 87,000 tons compared with 64,798 in February and 81,336 in January; pig iron, 37,000 tons against 33,469 in February and 37,468 in the preceding month; steel ingots amounted to 32,000 tons in March, 29,866 in February, and 32,565 in January; miscellaneous manufacturers of iron and steel totaled 23,276 tons in February, while in the preceding month they amounted to 21,501 tons. Unfilled orders on hand at the end of March reached 31,000 tons, while those on hand at the end of February aggregated 36,554 tons.

Raw Materials Affect Pig Iron Costs

BY THOMAS T. READ

IN BENEFICIATION of low-grade iron ores the fundamental question is how much more is the ore worth after beneficiation than it was before. To answer this question involves a critical study of the factors that enter into a determination of the relative worth of different grades of iron ore, coke and stone; and a correct determination is by no means easy.

The average conditions in smelting raw materials to make pig iron in this country, as set forth in the *Annual Statistical Report* of the American Iron and Steel institute, involve the smelting together of 3950 pounds of iron ore, 345 pounds of ferrous material other than ore, 2176 pounds of coke and 970 pounds of stone to produce a ton of pig iron. Averages are being dealt with, therefore no distinction is made as to the grade of pig iron desired, since that is a factor which must be considered in individual cases. The average pig iron probably approximates to basic pig, since over 50 per cent of the metal produced is of that grade. There is no way of getting at the average composition of all the iron ore smelted in this country, but the ore produced in the Lake Superior region amounts to 85 per cent of the total, and from the Lake Superior Iron Ore association we have rather complete statistics. The association's average figures indicate that the Lake Superior ore shipped in 1922 had the following average composition:

	Per cent
Fe (natural)	51.87
SiO_2	8.23
H_2O	10.78
P	0.099
Mn	0.76

We shall not be far wrong if we assume that coke on the average contains 86 per cent fixed carbon, 6 per cent silica, 2 per cent aluminum, 2 per cent lime and 1 per cent sulphur. Coke as actually charged in the blast furnace contains a variable percentage of moisture, but where blast furnace records are kept on the basis of skip loads this variable tends to cancel out, since the moisture does not affect the volume. Impurities in the stone will not be considered.

Neglecting for the moment the iron in the ore and the carbon in the coke, the most important item in the list of components is the silica, both from the standpoint of quantity and the effect it exerts on the blast furnace process. It is the silica in the ore and the coke that makes the addition of stone to the charge necessary, so that the whole cost of stone in smelting might be ascribed to the silica in the raw materials. But we cannot deduce from this that, if we could eliminate silica from the raw materials, we could also eliminate the limestone and thereby greatly decrease the cost of pig iron, for the matter is not so simple. Sulphur, which is present in the raw materials in small amounts, has a tremendous effect on the blast furnace process. Sulphur has so serious an effect on iron and steel that specifications never admit of more than 0.1 per cent in the finished product and in rivet steel, for example, only 0.05 per cent is admissible. Sulphur is so resistant to methods of removing it that the only good way is to keep it from ever getting into the pig iron; and this is one of the most important factors in blast furnace operation. What relation this has to silica in the raw materials is set forth as follows.

In a careful study of operations of 38 blast furnaces, made by T. L. Joseph of the bureau of mines, and to be published later, it was found that over 90 per cent of the sulphur entering the blast furnace with the raw materials was brought in by the coke, and only 7 per cent by the ore. Less than 5 per cent of the sulphur charged is permitted to go into the pig iron, over 85 per cent goes off in the slag and the rest is unaccounted for. The blast furnace must

From a paper presented at the spring meeting of the American Iron and Steel institute, New York, May 23. The author is acting assistant to director, United States bureau of mines, Washington.

remove over 95 per cent of the sulphur charged to it without letting it get into the iron. This makes it necessary to adjust both the quantity and composition of the slag. It must be higher in lime, so it will take up and retain the sulphur and it must be large enough in amount to take care of the total quantity. On the average, charcoal blast furnaces make only half as much slag per ton of pig iron as coke furnaces, because they have to dispose of less sulphur.

This extra slag adds to the cost of the pig iron in a variety of ways. The slag forming materials displace iron from the charge and cut down output, and what is much more important, they make it necessary to use additional coke to fuse them and this extra coke brings in more sulphur. In a recent paper Reports of Investigation No. 2560, bureau of mines, Mr. Joseph and myself have computed that an extra pound of slag requires a little over a half a pound additional coke. As the slag of the 38 furnaces referred to above averaged 1.67 per cent sulphur and the coke about 1 per cent sulphur, the final outcome of increasing the slag and adding coke is the elimination of the sulphur, but at a heavy cost.

Sulphur Cost Is 35 Cents

One pound of additional silica in the charge over the amount that gives the best results adds 1½ cents to the cost of a ton of pig iron through increasing the slag volume, according to the data in the paper cited above. One pound of sulphur added to the charge would add 0.85 of a pound of sulphur to the slag which would require 50 pounds additional slag to carry it off without increasing the percentage content; and this slag would require 20 pounds more coke, which would bring in a quarter pound more sulphur, and so on. On this basis one pound of extra sulphur per ton of pig iron in the charge adds about 35 cents to the cost of the ton of pig iron. One of the most important problems of the iron industry today is the securing of low-sulphur coke for blast furnace operation. This problem has been extensively studied by the bureau of mines and a number of papers by A. R. Powell and associates have helped.

The foregoing analysis gives us a general rule as to the amount of silica there should be in a blast furnace charge. There should be enough to yield a sufficient quantity of slag of the right composition to take care of the sulphur in the charge. Every pound of silica above this amount in a sufficient weight of charge to yield a ton of pig iron adds 1½ cents to the cost of the ton of pig iron, or, putting it in another way, every pound of silica in an ore above the amount that gives the right slag volume takes ¾ cent per ton off the value of that ore to the blast furncae operator. The value of such an ore, therefore, depends on the charge combination in which it is used. To an operator who needs to get more slag volume a high silica ore is desirable, within limits; while to the operator who has enough slag volume it makes an unwelcome addition to the smelting cost, unless it can be bought enough cheaper to counterbalance.

Remedy Adds to Disease

The ash constituents of coke seem small in percentage, but the tremendous effect of the sulphur has already been discussed. Six per cent of silica in the coke does not sound important, but it corresponds to 120 pounds of silica, or about 360 pounds of slag per ton of pig iron, and not only involves the adding of about 360 pounds of limestone to the charge, but requires 180 pounds of coke for the extra slag. Nearly 10 per cent of the coke required per ton of pig is needed only for fusing the ash in the coke itself. The coke needed to fuse the ash brings in more ash, and here again we have the situation that, as in the case of the sulphur, the remedy adds to the disease. In the case of coke that contains over 14 per cent ash not only is this difficulty accentuated, but S. P. Kinney has found, in an unpublished study of a single plant, that coke which carries over 20 per cent ash apparently produces a number of difficulties, due to altered conditions created in the bosh. At any rate every additional pound of silica in the coke not only means a pound less of carbon in the coke, but makes three pounds of slag, which calls for 1.5 pounds more coke. On this basis, if 2000 pounds of 86 per cent fixed carbon coke has cost $5.70 by the time it is in the blast furnace, then we are paying 3 cents per pound for the carbon, and 1 pound additional silica in the coke will take 7 cents off its worth to the furnace. A pound of silica more or less may seem a small matter, and yet a metallurgist will ordinarily devote a good deal of thought to the possibility of cutting his production cost 7 cents per ton.

Any complete discussion of the problems set forth here would involve the discussion of a good deal of detailed technology, such as the part which manganese in the charge plays in aiding sulphur elimination, the effect alumina has on the slag and on sulphur elimination, what factors have to be taken into consideration in substituting magnesia for lime as a slag constituent, and the whole fascinating field of consideration of what actually happens inside the blast furnace, on which we seem to be in process of getting a good deal of new light. We also have to take into consideration the reliability of our figures. The winter recently has undertaken a study of the probable error involved in using, in blast furnace calculations, the average figure for a whole cargo of iron ore, and while the study is not yet completed, it indicates that the probable error due to variability in compositon is many times larger in the case of the silica than it is with the iron. While the need is for more precise figures to permit more precise reasoning, it is felt that consideration of the broader aspects of blast furnace operation is also helpful, and it is for this reason that this discussion has been presented.

New Gas and By-Product Plant Is Operated

The new coal gas plant of the Consumers Power Co., Saginaw, Mich consisting of 19 small gas ovens and a central producer plant together with the necessary coal and coke handling and by-product recovery apparatus, was put into operation recently. When the ovens are heated with producer gas, the plant will have a capacity of approximately 2,500,000 cubic feet of gas per day, based on 12 hours carbonizing time. This capacity can be reduced quickly to 1,725,000 cubic feet by substituting coal gas for underfiring the ovens instead of producer gas and can be decreased further by lengthening the carbonizing time. The plant can be operated at any capacity between these figures by heating any desired number of ovens with producer gas and the remainder with coal gas. The ovens and producer plant were designed and built by the Koppers Co., Pittsburgh.

To Study Standards for Cast Iron Pipe

In accordance with the recommendations of a special committee of representatives of the cast iron pipe industry, the American Engineering Standards committee has called a conference to discuss the standardization of cast iron pipe. The meeting will be held in the Engineering Societies building, 29 West Thirty-ninth street, New York, Thursday, June 5. The special committee that suggested the conference had been organized to consider the requests of the American Gas association and the American Society for Testing Materials for the approval, by the American Engineering Standards committee, of their respective specifications for cast iron pipe and special castings.

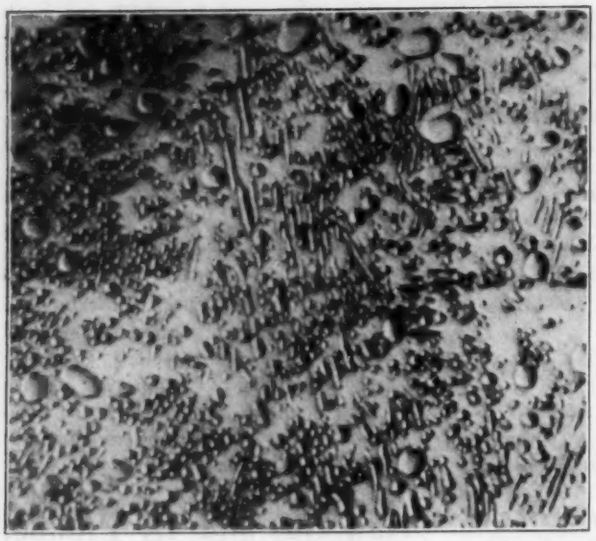


Fig. 1—Annealed Structure of Roll Forging. Conical Illumination. X 2000.

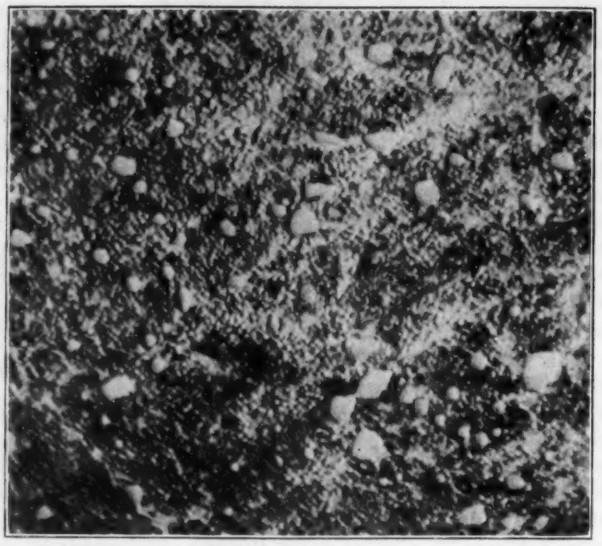


Fig. 2—Quenched and Drawn Structure. Conical Illumination. X 2000

Producing Hardened and Ground Rolls

BY J. R. ADAMS

MANUFACTURERS of hardened and ground rolls have adopted compositions that will more or less fall within the following: Carbon 0.70 to 1.25; manganese 0.20 to 0.40; silicon 0.15 to 0.30; and chromium, 1.50 to 2.50 per cent. However, we do not believe the above is the last word in composition for rolls, and are continually experimenting to obtain a composition that will produce a better roll.

Hardened and ground rolls usually are made from electric furnace, acid open-hearth, or crucible steel. The cleanliness of the surface and the final completion of the roll depend upon the character of the molten metal made, and the manner of pouring it, so that too much emphasis cannot be placed upon the cleanliness in both operations, or excessive loss due to imperfect surfaces will eventually occur. The ingots usually are cast in such a size that the reduction in forging is not less than 1:3. The fewer heats necessary to finish the forging operation the better, and the furnace should be large enough to contain the entire forging at all times. Large rolls should always be forged under a press, and it is much better for the smaller rolls. These precautions in forging have developed the practice of forging straight cylinders rather than to forge to the approximate shape of the roll.

The finished forgings usually are not allowed to become cold before annealing. They are charged immediately into an annealing furnace heated to a temperature below the critical. The annealing operations should be extra thorough and care should be taken that the forgings are held long enough above their critical temperature to completely remove any trace of forging structure. This usually is longer for chrome roll steel than ordinary steel. The beneficial results obtained by prolonged annealing were forcibly brought home to us some time ago by a change in the annealing of the large roll forgings, which greatly reduced the loss in the hardening operation and the number of retreatments. In cooling from the annealing temperature, precautions must be taken to see that no strains are set up in the forgings and that they are soft enough to be readily machined.

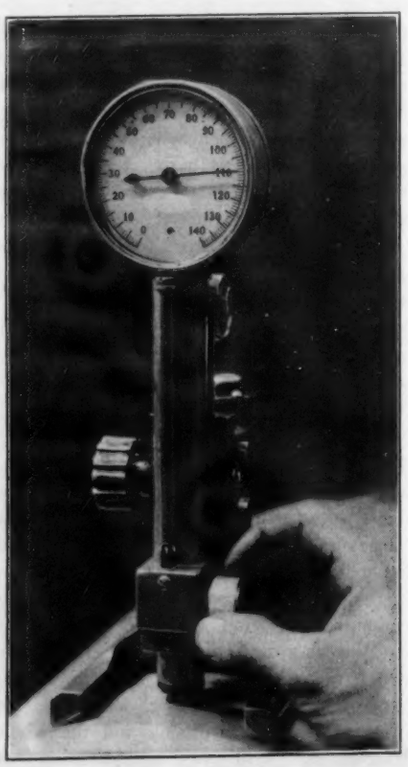


FIG. 3—SCLEROSCOPE IN STAND ON HARDENED ROLL

It is good precautionary practice to make a microscopic examination of test pieces taken from the forgings after annealing, to determine the efficiency of the anneal, and the cleanliness of the metal.

After annealing, the forgings are preliminarily machined in heavy-duty lathes, sufficient material being left above the finished size to allow for further heat treatment, and an axial hole bored through the center of the rolls to examine the interior for defects by means of a bore searcher. The machine surfaces should not be rough, lest the efficiency of the subsequent heat treatment be diminished.

As the annealed structure is one that does not best withstand the final drastic hardening, it usually is necessary to further heat treat the rolls before hardening. This treatment generally takes the form of one or more quenches and draws, depending upon the size and type of the roll. The quenching medium usually is oil, but some form of water quench may be used. A rapid quench is desirable to obtain a good structure, but the design of the roll must be considered, or breakage may result from too

From a paper presented at the May 23, 1924 meeting of the American Iron and Steel institute. The author is superintendent, research department, Midvale Co., Nicetown, Philadelphia.

severe a quench, since the material is susceptible to cracking. The drawing temperature is such as to leave the journals of the roll the proper hardness. If the draw is too high, the journals will be too soft, and excessive wear will occur in use, defeating one of the objects in using a hardened and ground roll.

In order to determine that the heat treatment given the roll has attained its object, a specimen for microscopic examination is taken from every roll.

Figs. 1 and 2 illustrate a properly annealed and heat-treated structure. The photographs were taken by Harry S. George, Union Carbide & Carbon research laboratories, by his conical illumination method.

After treatment, the radii on the ends of the body and the fillets between the journal and the body are properly formed to protect the rolls during final hardening. The radii on the ends of the body can usually be fairly large, since rolls are rarely used near the edges.

Hardening the Roll Surface

The hardening to the maximum degree of a mass as large as even a small roll is no easy matter, and when this mass becomes as large as a roll 24 inches in diameter by 46 inches long in the body, the difficulties are great, The hardening is carried out in various ways by different manufacturers. A water dip, either still or agitated, water spray or submerged spray are all used. Many large rolls cannot yet be quenched in a spray with consistent success, while the smallest rolls do not usually require spraying. The largest rolls may have to be hardened by a water dip, or even in oil. When this is done, a sacrifice in hardness may be accepted. In this connection it is of interest to note that H. A. Brustlein, of Jacob Holtzer & Co., Unieux, France, was the first to notice that some of the hardness of chrome steel is sacrificed if the rolls are not quenched in a spray. The hardening to the maximum degree of a mass as large as even a small roll is no easy matter. After hardening, the strains must be relieved without materially decreasing the hardness of the roll. For certain purposes, it is not desirable or necessary to furnish rolls of the maximum hardness, in which case they can be given a low draw. Some rolls have to be finished with hardened journals, in which case it is necessary to harden them all over. This increases the hazard considerably, but it can be done, and a number of hard journal rolls now are made.

Difficulty in hardening is sometimes encountered, due to the design of the rolls. Sharp angles, deep tapped holes near the surface of journals, thin sections produced by large counterbores for water-cooling attachments, light sections in wobblers, all add to the risk in hardening, particularly in rolls that require hardened journals. Rolls are manufactured according to the orders of the roll users, or manufacturers of rolling mills, so that the design cannot usually be altered for hardening, and in many cases the roll designer seems to have failed to give due consideration to the hardening problem.

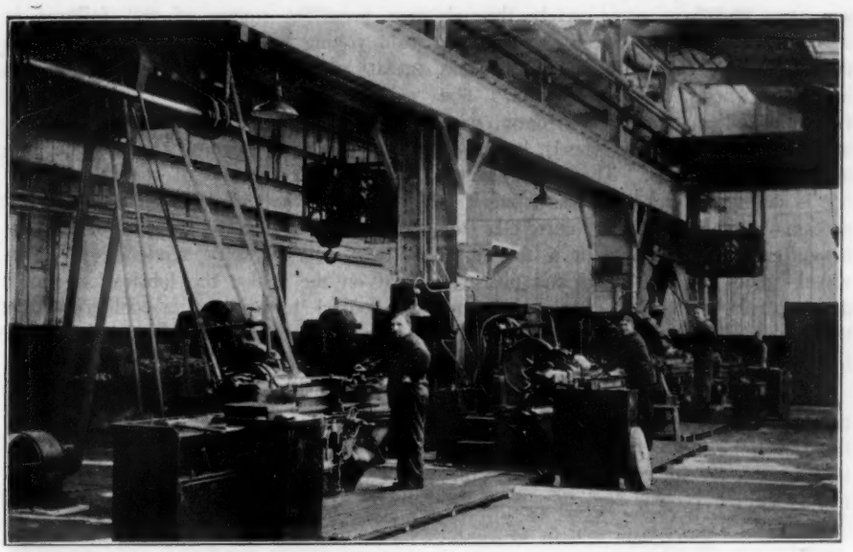


FIG. 4—BATTERY OF ROLL GRINDERS

After hardening and relieving the strains, the scleroscopic hardness of the rolls is determined for every inch on paths running the full length of the body. The number of paths varies from four on the smaller rolls to 18 on the larger rolls. If the scleroscope does not indicate the proper hardness or shows any non-uniformity, the roll is softened and rehardened. Scleroscopic readings are apt to vary, if the conditions under which they are taken are not rigidly standardized. We have standardized our conditions by always using the same scleroscope, and always, before using, checking it on blocks of the same size, material and hardness as medium diameter rolls.

The test blocks have been standardized by the makers of the instrument. If check readings indicate that the instrument is not reading correctly, it is sent at once to the laboratory to be cleaned and put into proper working condition. In damp weather this may be six or more times during the day.

The foundation on which the rolls rest during scleroscopic determination is always the same. The scleroscope is always used in the stand illustrated in Fig. 3, which we have adopted for this work. These methods give reasonably accurate results on rolls.

Careful Grinding Necessary

If the scleroscope indicates that the rolls are of uniform and proper hardness, they are sent to the grinding department.

Rolls that have been made from excel-

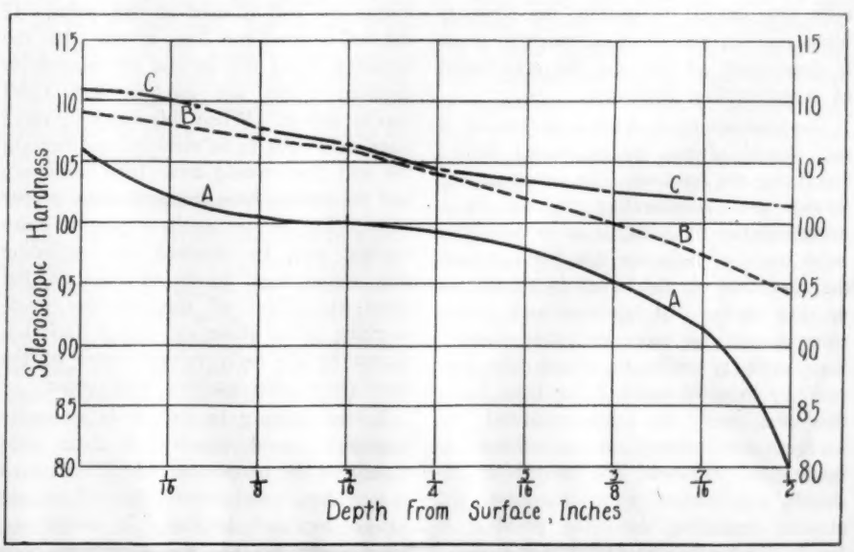


FIG. 5—DEPTH HARDNESS CURVES. *A*, 16-INCH ROLL HARDENED IN 1920; *B*, 16¼-INCH ROLL HARDENED IN 1923; *C*, EXPERIMENTAL 16¼-INCH ROLL HARDENED IN 1924

lent steel and have come safely through all previous operations can be entirely ruined in the finish grinding by using improper wheels, speeds or cuts. The rough grinding should be done with coarse, soft, free-cutting wheels, kept well opened at all times. The finish grinding is done with harder wheels, but it is necessary to take lighter cuts. If too heavy cuts are taken with a fine hard wheel, small hairline cracks and pits will develop. It is best to remove all but the last few thousandths with the roughing wheel before the finishing cuts.

The finished surface is of great importance. In most cases, rolls are furnished with a high finish, although this is not necessary for some users, since they grind special crowns on the rolls before they put them in operation. Unless otherwise specified, rolls usually are ground straight and furnished with a silver mirror finish. After grinding, the rolls are slushed to protect the surfaces from rusting, and the final machine work is done, such as that for the attachment of water-cooling apparatus.

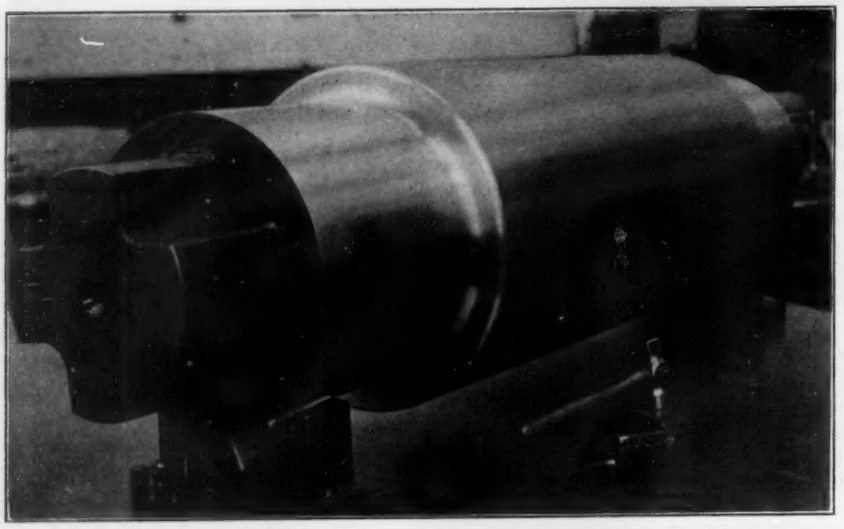


FIG. 6—HARDENED AND GROUND ROLL 20 INCHES IN DIAMETER AND 40 INCHES BODY LENGTH, WEIGHING APPROXIMATELY 5000 POUNDS

The character of work expected of a roll should always be considered before specifying the hardness. In following the service and investigating failures in a great number of rolls, it is evident that some users of rolls are not familiar with the care that should be given them; nor do they realize that hardened and ground rolls have to be more delicately handled than ordinary rolls to obtain the best results. In some cases, it has been found that the user had over-estimated the hardness requirements, and a scleroscopic reading of 110 was not needed or desirable. A reduction in hardness, the amount depending upon the problem in hand, usually has removed the cause.

Improper lubrication of roll jounrals and wrong adjustment of the bearings are prevalent causes of roll failures in cold rolling. One user states that in a great majority of the cases of spalled rolls that have come to his attention the journals of the rolls have shown signs of over-heating, and when the spall is near the end of the roll the adjoining journal has shown the greatest abuse from lack of proper lubrication. When rolls show a tendency to overheat on the necks, the lubrication should be looked to and water-cooling of the journals considered. The designs of the bearings and the material of which they are made has a great influence on the heating and wearing of roll journals.

When narrow strips are being rolled and the highest finish is not required, there is a tendency in most mills to roll too long on one journey on the roll. It must be remembered that the destroying of the surface is a breaking down of the metal, and this increases in extent the longer the roll is used at this point. If the roll is used too long in one spot, the breaking down will extend an appreciable distance below the surface and small checks appear. When this happens, more metal will have to be removed on dressing the roll than would have been necessary had the rolling been stopped at the proper point. Further, in such a case a clean surface may be obtained on regrinding that would seem to be satisfactory, but often the effect of the previous overworking is still there and makes itself apparent by the early re-appearance of the checks—or even spalling may occur.

Before starting to roll, it is generally considered good practice to heat rolls slowly to the temperature they will reach in operation, which insures the roll against sudden localized heating. It would appear better practice to warm the rolls from the inside through the bore rather than from the outside. Due to the hardness, the outside shell of the roll is in compression; therefore, heating from inside will tend to relieve stresses evenly.

Within the last few years, development and expansion of strip steel rolling has been considerable, and in order to keep pace with it, the manufacturers of rolls have raised their standards. Much of this improvement has been made by increasing the depth hardness. Some of the results are illustrated in the depth hardness curves shown in Fig. 5. The curve *A* shows the depth hardness of a 16-inch diameter roll made in 1920. Through changes in manufacture, this has been considerably improved upon, the depth hardness at one-half inch being raised from 80 scleroscope to 95 scleroscope, as shown by the curve *B*. Curve *C* shows that this may be further improved in the future, if the methods that were used to make this roll can be applied to actual practice

Due to the density, it was thought that high speed steel might be used to advantage for some types of rolls. We have made a pair of ring rolls for a manufacturer rolling high carbon round wire into flat wire. These rolls were 7 inches outside diameter and 3½ inches inside diameter with a breadth of face of 4 inches. The user reported that they required grinding only half as often as other rolls he had been using on the same work. Other experiments for the use of high speed steel in rolls are now under way, but, owing to the difficulties of hardening large pieces of this composition its use will probably be confined to the smaller rolls.

Critical Points Located by New Method

Measurements of the change in the thermoelectric power of iron or steel can be used for locating the critical temperatures of the metal, the bureau of standards, Washington, has found as a result of experiments. An abrupt change in the magnitude of this property indicates a change within the steel.

Knowledge of these critical or transformation temperatures is considered important in the heat treatment of steel, as they serve as a guide in determining the temperatures at which in heating or cooling a definite change takes place in the structure of the metal with a corresponding change in many of its properties. Ordinarily they are found by plotting a curve showing the rate of cooling of the metal. An abrupt change in this rate indicates the transformation temperature sought. Equally abrupt changes occur in the electrical properties of the steel, and of them all the thermoelectric power has been found the most convenient to measure.

Making Steel for Ordnance Use

Reduction of Iron Oxide To a Minimum Is Essential—Sulphur and Phosphorus Should Be Eliminated—Steel Quality Affected by Slag—Shop Practice Instructions Are Suggested

BY J. B. RHODES

IRON oxide must be reduced to the minimum in making ordnance steel. Phosphorus and sulphur must be reduced to 0.05 per cent and, if possible, eliminated. In the electric furnace we can easily keep below 0.025 per cent but not in the acid open hearth. Extremely low phosphorus may cause difficulty in machining, but the ill effects of sulphur and phosphorus in excess of 0.05 per cent are well known and it is suspected that the reason will be found when we consider that the oxides of these two, which form during freezing, do not collect and form inclusions as well defined as the silicon and manganese inclusions. Phosphorus will be held by a lime slag while metal is full of oxide and not too hot. To eliminate phosphorus in a basic electric furnace, we must slag off or the phosphorus will go back into the bath during the finishing period, when we are removing iron oxide and sulphur and obtaining hot steel under a white slag.

The temperatures of the bath and the furnace have to be considered when we deal with reactions. With a heat barely melted or with pig iron just after melting, there will be no action from the addition of iron oxide, but later as heat is applied the mixture will boil violently. So the carbon and oxygen do not combine until a critical temperature and superheat are brought in. On solidification we find that there is a temperature in cooling where the carbon oxygen combination takes place and the iron makes a last effort to get rid of the oxygen. This is what causes blowholes and puffs at the last minute in solidifying.

Temperature affects the elimination of phosphorus in a basic furnace. If the metal gets too hot, before the phosphorus is taken up by the slag, we will have no more elimination of the phosphorus. In fact, the phosphorus will go back into the metal if the bath is quieted and deoxidized. In the basic open hearth, when we are eliminating the phosphorus of the charge, we tap the heat while still wild and deoxidize in the ladle with ferroalloys. In the basic electric furnace, we take off the slag through the spout and then deoxidize and refine the heat. Whatever phosphorus gets into the slag as $P_2 O_5$ will be held as a calcium phosphate until we put silicon or manganese into the metal or carbon on the slag. These will reduce the phosphates and put phosphorus into the metal.

With the slag as hot as the furnace will stand, the slag in an acid open hearth furnace will get thick. The reason for this is that the iron oxide of the slag is taken into the bath in which it is soluble and is reduced by the carbon of the bath, leaving a larger percentage of SiO_2 in the slag. The addition of fluorspar and lime at this time will furnish an oxide to replace the iron oxide and make the slag thin. The bath near the walls and bottom of the furnace is colder than the part of the bath closer to the flame and it is possible that one may be below the critical temperature for carbon reaction in one part and not in the other. As a result, it is important to stir and rabble the bath so as to bring the temperature up to the critical point throughout. In fact, to get the best results and to eliminate iron oxide to the limit, we must superheat the hottest part of the bath nearest the flame. With this condition of superheat and a slag with the iron oxide reduced to a point where we have to add some thinning agent, we may expect the bath to pick up silicon from the silica. It is suspected that the iron of the bath is converted to iron oxide by the oxygen of the silica and that the silicon which is so freed goes into the metal. Iron takes only half the oxygen that silicon requires so that two atoms of iron are oxidized to free one of silicon and the percentage of silica in the slag tends to rise at this time.

Steel Slags Are Analyzed

This paper is largely devoted to making slags and it will be supplemented by some chemical results that have been obtained. The chemical composition of slags has been described in text boks, but the slags described below were taken from large electric furnaces and in all cases the physical values on tangential test were superior to 100,000-70,000-20-45. When it is considered that these were transverse tests of nickel steel, it seems fair to say that the elimination of sulphur and phosphorus as shown by the analyses and the elimination of iron oxide as indicated by the small amount in the slag and the low manganese in the slag, has produced the best ordnance steel. Slag should not contain more than 1 per cent of FeO nor more than 0.50 per cent MnO and not more than 1.25 per cent FeO plus MnO.

If the slag is made properly, the steel will almost take care of itself. The making of proper slags depends a great deal upon the tool that we use. The electric furnace is the best tool, for we can hold the steel in the furnace and alter the slag by increasing the heat or making additions to the slag or furnace, whereas in a furnace where the slag is exposed to a flame, the action of the flame will affect the slag and metal. We cannot shut off the flame long because the heat will become too cold to tap. Any change in the slag means a change in the steel; in a slag of lime and iron oxide there is no real stability until the iron oxide is replaced by calcium carbide, for the amount of iron oxide in the slag will vary as the oxide in the bath varies. Any stability is temporary and depends upon the relation of the bath to the slag and in an open hearth furnace the flame continually disturbs the balance.

The electric furnace provides a neutral atmosphere or even a reducing atmosphere on account of the carbon of the electrode. It is easy to reduce manganese, silicon, molybdenum, chromium or other alloy into the bath due to the reducing action. It is more striking to add a new element, as has been done with calcium molybdate, than it would be to increase the silicon or manganese. It is more certain that we are reducing molybdenum into the steel than that we are adding iron as we reduce iron oxide, that is to say, the evidence is more tangible. To demonstrate the possibility of reducing an alloy into the steel, it is recommended that sand be added to the slag and reduced to bring up the silicon of the metal; this can be tried out for demonstration to melters and helpers after the furnace bottom has lived its life. This reducing of silicon into the metal will show the intimate relation between the slag and the metal and, until this relation is fully realized in all its phases, the operators on the furnace will not get the best results. Observation of slags and study of physical tests make it possible to say that the best

From a paper presented at the spring meeting of the American Iron and Steel institute, New York, May 23. The author is a commander, United States navy, United States navy yard, Washington.

way to get steel free from iron oxide, and the inclusions it produces, is to get the iron oxide out of the slag. In whatever furnace we use, the steel is not in proper condition until the iron oxide of the slag has been reduced to the lowest figure that we can reach with safety.

Iron Oxide Is Negligible

In an acid open hearth furnace, as stated before, the silica of the acid slag will take up iron from the bath and reduce silicon into the steel; this maintains the percentage of iron oxide plus manganese oxide of the slag at about 35 per cent, measured in terms of metallic iron and manganese. So we never get acid slag entirely free from iron oxide, but when we are reducing silicon into the metal, as shown by the increased silicon of the metal, we can be confident that there is not a harmful amount of iron oxide remaining in the bath. The addition of lime and fluorspar to thick and viscous acid slags frees iron oxide from the slag to reduce the carbon of the bath and reduces the amount of iron oxide in the slag. Proper acid open hearth slag will be green in color, due to manganese oxide, vitreous and free from blowholes in samples taken of the slag. If a slag is of proper color and consistency, but too thick, it is possible that the metal may be exposed to the oxidizing action of the flame and so oxidized as to offset the good slag. Even with the best of acid slags there is not as much reason to feel that the iron oxide has been eliminated as in the electric furnace, for the slag will continue to react with the bath as the temperature changes.

It is not only necessary to have a proper green slag, but the metal must be made as hot as possible so as to get the maximum reduction of iron oxide by carbon. This heat is distributed throughout the bath by rabbling, so as to get all the iron oxide in solution in the bath up to the critical temperature, for the carbon-oxygen reaction to take place. Even after this has been done and the metal lies quietly in the test mold, the addition of silicon to the bath to bring the content up to about 0.25 per cent, followed by the addition of manganese to bring the manganese to about 0.65 per cent, will still further reduce the iron oxide and will furnish deoxidizers to prevent the formation of gas on solidifying, for oxygen has been picked up by the molten stream, from the furnace to the ladle and from the ladle into the mold.

Some steel makers state that elimination of oxide from steel is not necessary. Probably this is based on the fact that they have produced steel which has been used in guns and which they know has contained oxide. The fact that steel containing iron oxide and blowholes, but no inclusions, is superior for tin plate, for example, does not mean that similar steels can be used for ordnance, for the accumulation of the inclusions into globules of relatively large size is safer than the distribution of such oxide between the grains. With steel so thoroughly killed as to give off no gas, we get material so dense that there is a risk of cracking on solidification. This must be taken care of by teeming at a slow rate and by allowing the metal to cool to a point where there will be a small skull in the ladle and barely sufficient heat to run through the nozzle without streamers. Besides the objectionable iron oxide, we must eliminate other factors which can cause defects in the transverse tests which are taken for ordnance steels. The rate at which the mold is filled must be made as slow as possible; the temperature of pouring must be kept down. These two factors, when properly controlled, give a characteristic appearance of the top of the metal in the mold, which has been described as a breaking creamy appearance.

Slag Analyses of Electric Ordnance Steel

SiO_2 Per cent	FeO Per cent	Al_2O_3 Per cent	MnO Per cent	CaO Per cent	MgO Per cent	P Per cent	S Per cent
19.54	0.58	4.27	0.06	62.86	7.38	0.004	0.687
18.38	0.83	3.15	0.21	62.22	8.34	0.005	0.444
24.01	0.90	3.16	0.34	50.74	15.55	0.001	0.308
19.20	0.75	4.39	0.52	61.78	12.77	0.044	0.360
19.54	0.54	4.27	0.06	62.88	7.38	0.004	0.360
18.38	0.83	3.15	0.21	62.22	8.34	0.005	0.444
....	0.64	...	0.05	63.38	...	....	....
....	0.85	...	0.15	55.88	...	....	....
....	0.61	...	0.10	59.40	...	....	....
....	0.81	...	0.10	56.76	...	....	....
....	0.57	...	0.12	54.88	...	....	....
....	0.77	...	0.12	56.56	...	....	....
....	0.53	...	0.04	62.26	...	....	....
....	0.43	...	0.26	59.92	...	....	....
....	0.65	...	0.06	60.16	...	....	....
....	0.65	...	0.05	52.36	...	....	....

Rapid Chilling Is Essential

Thickness of the mold must be great enough to give the least possible time for the reactions to take place. Thick mold walls with a ratio of 3 to 1 will chill the metal and give the maximum practicable speed for solidification. In one experiment with a steel containing 2 per cent manganese it was found that an extraordinary, heavy chill and the pouring of the metal through an iron runner of the mold gave a most excellent material. The difference between the results in this mold and the results obtained in an ordinary mold with the same composition has been assigned to the rapid chilling of the metal. In ordinary molds 2 per cent manganese in metal will make metal extremely brittle, whereas with the mold described the test bar bent to 180 degrees around a 1-inch radius.

Quick Cooling Lessons Inclusions

In spite of our efforts to remove oxygen from steel and to obtain inactive slags, there are further reactions to be reckoned with. Even if the steel in the furnace has reached the limit as regards cessation of reactions, yet the agitation of the metal from the furnace to the ladle and from the ladle to the mold, the change in the temperature that occurs after the heating has ceased and the exposure of the metal to the oxygen of the air, will so change conditions as to permit the occurrence of reactions, in the solution of iron, oxygen, carbon, silicon, manganese, sulphur, phosphorus and alloys. Such reactions, affecting the intergranular structure of the metal, continue to occur until the metal has solidified and the grains have formed. These reactions produce gas or solid nonmetallic impurities, which cannot escape during solidification, evidence of which is found under the microscope in the form of gas holes or inclusions. The formation of gas or inclusions is less pronounced in metal which remains in the mold for the shortest possible time in the liquid state. This quick chill is obtained by: Slow pouring, using small nozzles; holding metal in furnace and in ladle: use of ingot mold with an area of mold about three times as large as the area of the metal which it contains.

The use of heavy chill molds to prevent the formation of gas holes has led to the abandonment of the advantages of bottom pouring. It is recognized that bottom poured ingots have excellent surface and that they forge well, but this is partly offset by the risk of carrying into the mold the inclusions resulting from the reaction between the runner brick and the metal and even the scourings from the brick. In using the heavy chill molds and obtaining the quick chill, it has been found that the use of a pouring box or tun dish gives more uniform rate of pouring and a better average appearance of the bottom of the ingot. There is a risk of carrying inclusions into the ingot just as with bottom pouring, but it is believed that material carried in from a pouring box will have more chance to get out of the

(*Concluded on Page* 1433)

Power Consumed in Rolling Steel

Numerous Factors Govern Amount of Power Required for Rolling Steel—Power Consumption as Related to Displacement of Metal Is Presented Graphically—Load Variation Contingent Upon Rolling Temperature

BY GORDON FOX

ALTHOUGH power ordinarily is not a major factor in conversion costs, it is of sufficient mangnitude to warrant careful consideration. The use of electric drive greatly facilitates the securing of power consumption data. Many mills secure only such data as is necessary for monthly cost distribution purposes. In some instances the electrical distribution and metering systems are such that extended estimating is necessary to obtain even these data, and power cost figures are correspondingly debatable. The possibilities for economies in power usage are not likely to be realized in the absence of complete and accurate information as to the results obtained. It is the experience of the writer that the costs of providing suitable metering equipment and obtaining sufficient records can be fully justified provided these records are analyzed and the data usefully applied.

It is of interest to note a material uniformity among plants in the matter of power consumed as related to horsepower of motors connected. Naturally, there is some variation between plants differing in size and character. Data as to the normal average power consumption of several plants of varied size and type are presented in the accompanying table.

The relation of power consumption to connected horsepower varies materially between departments in a given plant. The relative power consumption of motors by departments in one plant follows:

	Ratio average kw to connected h.p., per cent
Blast furnace, exclusive of pumps	10.3
Open hearth	13.5
Soaking pits	10.5
Blooming mill	28.5
Billet mill	21.2
Plate mill	26.2
Skelp mill	24.9
Pipe mill	33.5

At the blast furnace, open-hearth and soaking pits, the drives are largely of the intermittently operated type and the use factor is relatively low. In the rolling mills, the influence of the main drives leads to a higher use factor. At the pipe mills, much of the machinery is of the steady running type and friction load is a ruling element, hence a relatively high use factor.

In rolling blooms, billets, slabs, sheet bars, plates, strips and similar shapes the metal is displaced largely in the direction of rolling. It has been found that the power required for this class of rolling is a resonably consistent result of several governing factors. In rolling special shapes in closed passes, such items as side displacement, indirect pressure, collar friction and end thrust complicate the problem to such an extent that no formulas are applicable and determinations of power must be based on precedent.

In simple rolling, the power requirement is a function of the volume of metal displaced. It may also be considered with reference to elongation, which is a related factor. If all conditions remained the same throughout a simple rolling operation, the power required per cubic inch of metal displaced would be a fixed quantity. Several changing conditions serve to modify this relation. Foremost among these is temperature. Cold rolling requires roughly twenty times the power of hot rolling per unit displacement. A drop of 400 degrees Fahr. in temperature approximately doubles the power required. This relationship is shown in Fig. 1 which has been prepared from data presented by G. P. McNiff in *Chemical and Metallurgical Engineer*, 1920 page 660.

The degree of temperature variation throughout a rolling operation

Abstract of a paper presented before the American Iron and Steel institute at New York, May 23. The author, Gordon Fox, is electrical engineer, Freyn, Brassert & Co., Chicago.

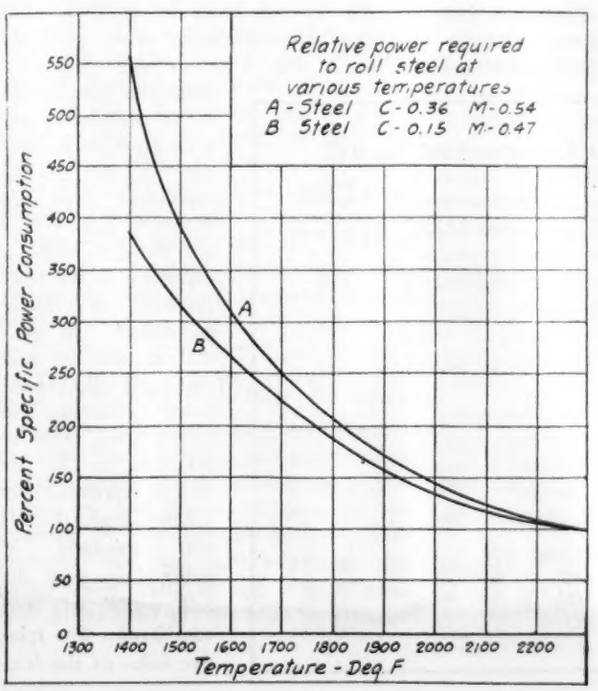

Relative power required to roll steel at various temperatures
A - Steel C - 0.36 M - 0.54
B Steel C - 0.15 M - 0.47
Percent Specific Power Consumption
Temperature - Deg F
A
B

FIG. 1—RELATIVE POWER REQUIRED TO ROLL STEEL AT VARIOUS TEMPERATURES

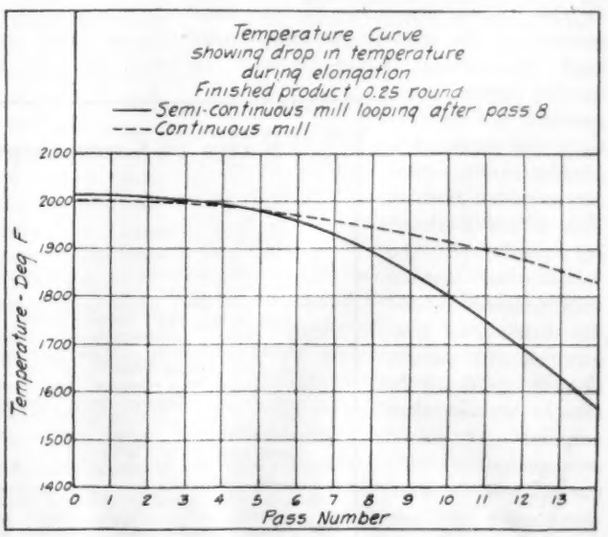

Temperature Curve showing drop in temperature during elongation
Finished product 0.25 round
—— Semi-continuous mill looping after pass 8
--- Continuous mill
Temperature - Deg F
Pass Number

FIG. 2—CURVE SHOWING THE DROP IN TEMPERATURE DURING REDUCTION OF THE METAL

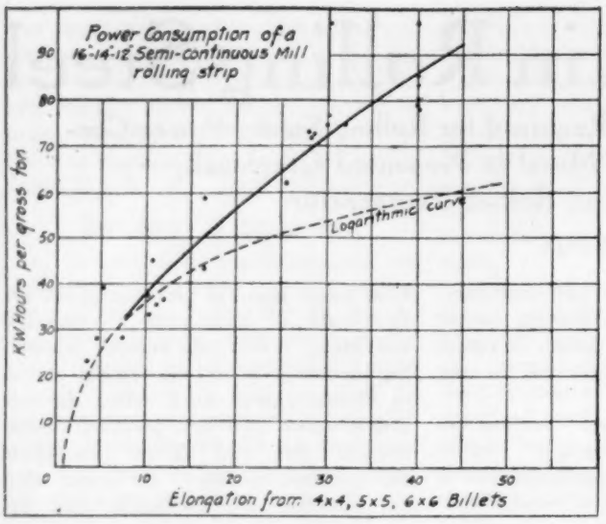


FIG. 3—POWER CONSUMPTION OF A SEMICONTINUOUS STRIP MILL

Frictional load of roughing mill and drive, 175 kilowatts; finishing mill and drive 200 kilowatts

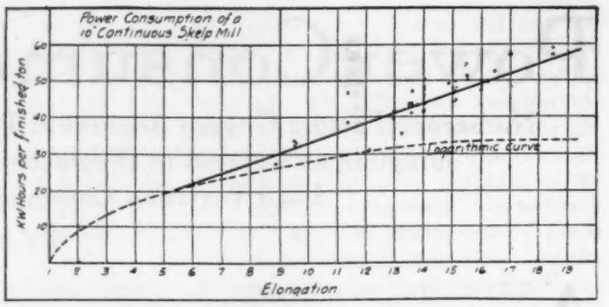


FIG. 4—POWER CONSUMPTION OF A CONTINUOUS SKELP MILL

Frictional load of roughing mill and drive, 100 kilowatts; finishing mill and drive, 150 kilowatts. Average power consumption 52 kilowatt hours per ton

depends upon the size and shape of the section, with particular reference to the area exposed, per unit of volume. The time of exposure has a direct bearing. This is affected by the number of passes, the type of mill, the speed and the method of handling and reducing the steel. The curves shown in Fig. 2 from data by G. E. Stoltz in the Dec. 1922 *Proceedings* of the Association of Iron and Steel Electrical Engineers, are of interest as examples, showing the range of temperature variation in two mills of the semicontinuous and continuous types rolling ¼ inch rounds.

In the derivation of load charts for determination of power required for each pass and for combinations of passes in a proposed rolling schedule, curves showing variation in specific power consumption are of value. These curves show the variation in power demand per unit of volume displaced as the rolling proceeds. As the temperature of the steel is the most prominent determining factor, curves of specific power consumption are substantially the result of a combination of such curves as are given in Figs. 1 and 2, showing respectively the variation of demand with temperature and the variation of temperature with elongation or reduction in area. A convenient measure of power consumption of various mills is the kilowatt hours per ton. Such figures do not mean much, however, unless qualified by the elongation. This measure is useful for comparing or estimating the power consumption of mills producing a given tonnage from and to stated dimensions. It also is useful as a check on the continuous capacity of motors installed.

Numerous curves showing the total power consumption as related to elongation in several types of mills are presented. Due to many variable factors, but mainly due to variation of tonnage per unit of time, the points which establish these curves are more or less scattered, but lines may be drawn through them which are representative of average conditions. The points are shown so that the extent of variation and departure from the average condition may be noted.

Theoretically and if the specific power consumption remained constant, it should require the same amount of power to elongate from 1 to 2 times, 2 to 4 times and 4 to 8 times, etc., the original length, since the volume displaced in each case is the same. The theory above outlined gives a logarithmic curve in which power consumed is proportional to the logarithm of the elongation.

For the sake of interesting comparisons, there has been plotted on each curve sheet a theoretical logarithmic curve to which the actual derived curve is tangent and which blends with the derived curve for small elongations. This logarithmic curve indicates about what might be expected if the specific power consumption were constant, if the temperature during rolling did not vary and if the friction load were proportional to the displacement. The departure of the actual curve from the logarithmic curve is of interest as indicating primarily the effect of cooling and the result and increase in specific power consumption. It will be noted that, in the case of the blooming mill, the actual and theoretical curves do not differ greatly, due primarily to the fact that the steel does not cool rapidly in this type of mill. A mill of the semicontinuous type, such as shown in Fig. 3 shows wide departure from the logarithmic curve resulting primarily from rapid cooling. A mill of the continuous type, as shown in Fig. 4 does not show so wide a departure as the temperature is better maintained. In general it may be said that, of the total power consumed in rolling steel, from 10 per cent to 30 per cent is represented by friction load, that is the equivalent of idling loss over the full period of time considered. The relative value of the fric-

Ratio of Consumption to Connected Load

Character of Plant	Connected HP of motors	Total Ave. monthly electric consumption KW hours	Ratio Ave. KW to connected HP per cent
Merchant blast furnace:			
Exclusive of pumps	2,672	242,000	13.9
Inclusive of pumps	3,522	692,300	30.2
Coke ovens, blast furnaces, open-hearth and mills. Mills steam driven	13,584	1,550,000	17.6
Coke ovens, blast furnaces, open-hearths and mills. Mills part steam and part electric drive	71,314	8,960,000	19.3
Coke ovens, blast furnace, open-hearth and mills. Electric drive throughout	34,250	4,750,000	21.3
Open-hearth and mills. Mills part steam, part electric drive	13,740	1,456,000	16.3
Open-hearth and blooming mill. Electrically driven mill	7,203	1,110,000	22.4
Open-hearth, blooming mill and finishing mills, all electrically driven	34,924	5,506,800	24.3
Finishing mill producing hoop, hot and cold rolled, from billets. Electric drive throughout	5,403	1,098,000	31.5
Wrought iron mill. Busheling and piling. Steam driven squeezer and mills. Electrically driven auxiliaries. Lighting relatively large item	721	107,500	37.0

tion load is a function of the tonnage per unit of time. Delays, an excess number of passes, and slow handling of the steel passes contribute to a relatively high frictional consumption. The power required for rolling steel may be considered as composed of two main components. The idling friction component is taken as a constant quantity and is proportional to time. The rolling power component involves both the displacement of the metal and all other contributory items. This load is closely proportional to the tonnage produced (for a given rolling order). The total power consumption is the combination of these two components. In Fig. 5 is shown how the total power consumption over 24 hours various according to the tonnage output over this period (Curve A). From the total consumption and the corresponding tonnage a series of values of kilowatt hours per ton may be derived (Curve B). It should be clearly apparent, from this curve how decidedly the power consumption is influenced by the rate of rolling. This may be further enhanced by a higher unit cost of electric power for lesser quantity. From the point of view of power consumption it is highly desirable to keep a mill full.

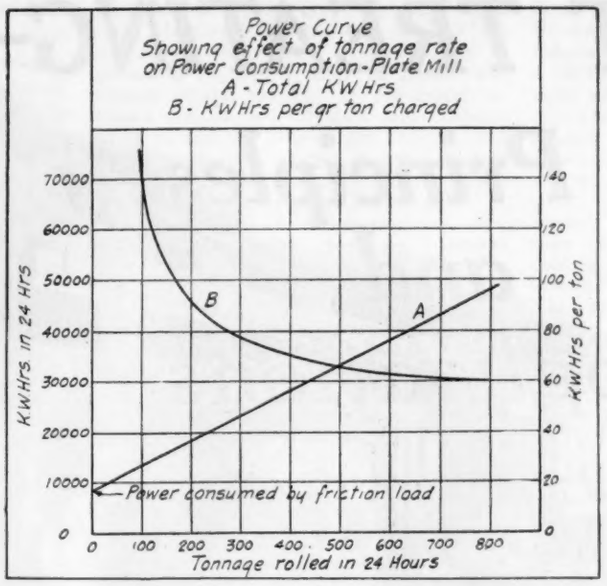


FIG. 5—THEORETICAL INFLUENCE OF THE TONNAGE RATE OF A PLATE MILL ON POWER CONSUMPTION
A—Total kilowatt hours
B—Kilowatt hours per gross ton charged

Report Fewer Employes

The number of employes on payrolls of 100 firms in Cleveland, reporting to the chamber of commerce, was reduced to 73,431 on May 1, compared with 77,033 April 1. This is a drop of 4.7 per cent. The employment index, which is based on Jan. 31, 1921 as representing 100 dropped almost six points, from 117.3 to 111.7 during the month. Twenty-three out of 49 firms reporting on the subject stated that they will reduce their working forces during May. Twelve expect increases and 14 report no change. The hiring rate for unskilled labor in Cleveland during April advanced to 45.6 cents, reported by 75 firms.

Plow Parts Duty Free

Parts of plow assembly are entitled to free entry under paragraph 1504 of the tariff act, according to a decision of the board of general appraisers of the customs service. This decision has no application to articles made dutiable under such general provisions as castings and forgings.

Making Ordnance Steel

(*Concluded from Page* 1430)

metal than that resulting from bottom pouring.

The quality of a heat of ordnance steel is the result of a large number of variables. It is believed that the variables are important in about the following order: (1) Slag composition; (2) pouring temperatures; (3) rate of pouring; (4) size and condition of nozzles; (5) time held in furnace and ladle; (6) kind of charge into the furnace; (7) temperature of ingot when stripped; (8) temperature of ingot when heated for forging. These variables are recorded for each heat and made available for analysis and comparison with the history of the piece until it has been subjected to physical test. Study of records showing these variables has resulted in "Shop Practice Instructions." These shop practice instructions are believed to be necessary to reduce the number of variables.

It is known that high-grade ordnance steels are produced when certain practices are followed in the melting department and that variations in these practices may cause failure of the material successfully to pass tests now required, notwithstanding any efforts made in forging or heat treating to correct the defects resulting from poor melting practice.

A record will be kept showing how far these practices have been effectively carried out for each heat of steel.

The following practices will be observed in the handling of the melts:

1. MELTING: In acid steel, reduction of carbon in the bath shall be accomplished at least 2 hours before tapping, to allow ample time to condition the slag and obtain the necessary temperature conditions for effecting refinement. The refining operation can be facilitated by adding silicon to the slag and ferroalloys to the steel, but such practice is not as desirable as accomplishing the desired refinement through temperature control and slag control.

2. SLAG: In basic electric steel, the sum of iron and manganese oxides expressed in terms of metallic iron and manganese, shall not exceed 1.25 per cent. In acid open hearth steel, the sum of iron and manganese oxides expressed in terms of metallic iron and manganese shall not exceed 35 per cent. In the basic electric slag, this condition will be met when a slag is produced which gives off strong acetylene fumes and disintegrates into a pure white powder. In acid slag, it is met when the slag is light green in color, and solid and free from blowholes.

3. COMPOSITION: The steel shall be finished in the furnace to the composition specified on the melt orders and no additions for correcting the composition of the steel shall be made in the ladle. The use of aluminum in the ladle is not forbidden.

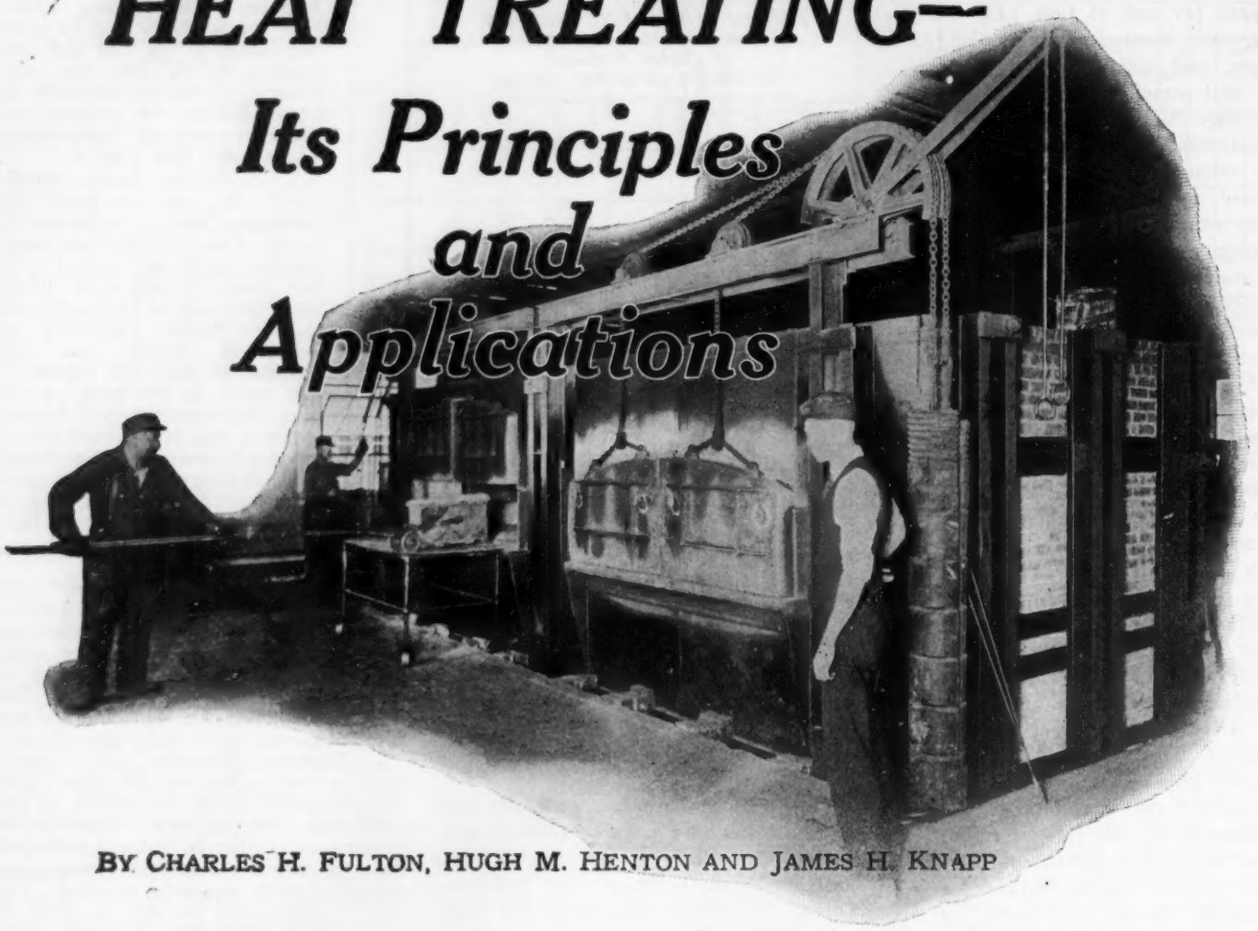
4. TEEMING: Teeming of ingots shall be such as to cause the most rapid transformation from the molten to the solid state. Metal shall be held in the furnace and in the ladle for a sufficient time to obtain the lowest temperature consistent with successful teeming. The rate of pour shall be kept as slow as is consistent with clean surfaces. Unless specifically authorized, all heats shall be box poured, using the smallest nozzle in the box which practice has shown to be usable.

5. STRIPPING OF INGOTS: Stripping shall be accomplished at temperatures not below 1600 degrees Fahr., ingots to be immediately transferred to the forge shop whenever practicable. When delays in transportation to the forge shop are unavoidable, ingots shall be buried in sand or ashes so as to retain all the heat possible.

Sales Schools Held

The Link-Belt Co., has adopted a policy of holding annual sales schools. The most recent of these schools was held at the Indianapolis factory, May 5-8. The salesmen, 19 in number, came from the Boston, Philadelphia, Toronto, Pittsburgh, Cleveland, Detroit, Chicago, Seattle and Indianapolis offices. This school was addressed by several of the company's officials among whom were Alfred Kauffmann, vice president in charge of the Indianapolis works and Julius S. Holl, advertising manager. Not only does the school permit the men to see and inspect the various malleable, steel and silent-chain plants, and meet the officers and department managers, but the interchange of ideals among the men makes for better feeling, fraternity and a dissemination of sales information.

HEAT TREATING—
Its Principles and Applications



BY CHARLES H. FULTON, HUGH M. HENTON AND JAMES H. KNAPP

Chapter VII—Carburizing and Case Hardening

THE general explanation of the heat treatment commonly and vaguely known as the "case hardening" process, has been given in Chapter IV. There are really two distinct divisions: first, the carburizing, carbonizing, cementing, or casing of the exposed part with increased carbide; and second, the hardening of the case by quenching one or more times in water or oil from above one of the critical temperatures.

According to definitions recently approved tentatively by the American Society for Steel Treating, *carburizing* is adding carbon, with or without other hardening elements, such as nitrogen, to wrought iron or steel by heating the metal below its melting point in contact with carbonaceous material. *Case hardening* is carburizing the surface portion of an object and subsequently hardening by suitable heat treatment.

Two distinct classes of material are carburized, viz., low-carbon steels and wrought irons, and high carbon steel tools. That branch which treats the latter is popularly called "pack hardening," but as usual the popular name in itself fails to definitely distinguish this treatment from the first. Both classes may be "packed" in boxes and carburized by the absorption of carbon from highly carbonaceous solid material. The fundamental difference between the two is that soft steels or irons are cased deeply, while the high carbon tools are cased superficially. This necessitates a distinct change in heating time, temperature or carburizing agent, or all three.

The soft steels usually used for carburizing range from 0.15 to 0.25 per cent carbon. Wrought iron may be used where the core may be soft and weak, and where such a condition is satisfactory for the purpose of the finished object. Medium carbon steels from 0.25 to 0.40 per cent carbon may be used where greater stiffness and strength of core is desired. As far as the process is concerned, any steel unsaturated with carbon can be carburized by a suitable agent and by suitable temperature conditions. The nearer saturation (1.7 to 2 per cent) a steel is, the more difficult will be the introduction of carbon below the melting range. The introduction of carbon to a content greater than 2 per cent makes the steel over into a material like cast iron. This phenomenon only results from an "overheating" into the "burning" or beginning of melting zone, in the neighborhood of 1120 degrees Cent. (2048).* Such over-carburizing or cementing is not good practice. We must confine the carburizing to the act or acts which make a higher carbon steel case from a homo-

*The figures in parentheses represent degrees temperature in Fahrenheit.

Lists Parts Adapted to Carburizing

THE accompanying installment is the first of five devoted to carburizing and case hardening. Chapter I of the series appeared Oct. 4; Chapter II was published in the issues of Oct. 18, Nov. 1 and Nov. 15; Chapter III in the issues of Nov. 29, Dec. 13 and Dec. 27; and Chapter IV in the issue of Jan. 10. Chapter V appeared in the Jan. 24, Feb. 7, Feb. 21, March 6 and March 20 issues. Chapter VI appeared April 3, April 17, May 1 and May 15.

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geneous lower carbon content raw material.

Steel for carburizing and case hardening should be well worked mechanically. It must be hammered, rolled, pressed, drawn, and forged in various ways while being shaped to the form desired. The way in which mechanical working affects the form of the carbon and the inside grain structure of the piece depends upon the way the heat is applied as well as upon the thoroughness of the work itself. The chart, Fig. 63, shows heat effects upon carbon, structure and mechanical working. It will serve as an adequate review of the crystalline structure, described in chapters II and III, and will show the refinement possible and necessary for raw material.

This chart, which was prepared by Prof. John F. Keller,* is explained by him as follows:

"Iron and steel are crystalline solids. Development of the crystals depend upon three factors: elements in the metals, plasticity, with time. As indicated in section *a* of Fig. 1, dots or nuclei will attract crystal matter. If the metal remains undisturbed, crystals will coalesce as at *b*, and the size of the crystals will be in proportion to the length of time of cooling. Therefore, Fig. 2 represents the structure of slowly cooled steel.

"The rolling or hammering of iron or steel has three purposes: general shape desired, lamination, and the prevention of crystal development. These conditions are obtained by continued working of the metal until a temperature is reached where crystallization ceases. The fracture will represent, by the size of the crystals, the temperature above *A* at which the iron or steel is laid down.

"The greatest efficiency of iron and steel is developed only when they are heated to their 'critical temperatures,' then treated according to the requirements of the materials. The 'critical temperature' of iron is 1652 degrees Fahr., indicated above Fig. 3 at Ar_3. If 0.85 per cent of carbon is added to iron, that point is lowered as indicated at Ar_1, and this point *A* will be known (hereafter) as the 'critical temperature' of iron and steel.

"With reference to the curve on the right of Fig. 3, temperature changes are measured vertically in degrees Fahr. The change of time is measured horizontally. Therefore, the inclined line *D* indicates a temperature change upward, occupying some appreciable time, that is, slow heating. *E* indicates a gradual temperature change downward, that is, slow cooling, and the vertical line *M*, indicates instantaneous cooling or 'quenching.' The arrows indicate the direction of heating or cooling, while the circles indicate the size of the grain or crystals.

"To forge iron or steel to the shape desired, it must be heated to a semi-plastic state. The greater the plasticity, the less energy is required to move a given mass of material. Therefore, when the above metals are reheated, *G* indicates that the granular structure remains constant until *A* is reached, at which a molecular change occurs, reducing the grains to their smallest possible size. The temperature at which this change occurs is entirely too low for forging. Therefore, it may be noticed

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Table XVI

Metallographic Properties of Iron and Steel

Constituent	Feature other than Hardness	Carbon in Per Cent	Microscopic Appearance Etching Color	Etching Speed	Hardness	Microscopic Appearance Unetched	Color Etched 10% HNO_3 20 sec.	Figures 10% HNO_3 20 sec.	Arrangement of Figures	Reheating Temperature Deg. C. after Quench	Material
Martensite	Brittle	.1–2.0	Brown	4th	2nd	Bright	Brown	Lance-like needles	Triangles or velvety	Below 200°	Steel
Troostite	Strong not brittle	.1–2.0	Black	1st	3rd	Bright	Black	Rounded elongated	At austensite boundaries	200° to 500°	Steel
Sorbite	Tough springy	.1–1.7	Dark	2nd	5th	Bright	Dark	Indefinite gray spotted	Whirly or massive	500° to 600°	Steel
Pearlite	Somewhat ductile	0.9	Pearly spotted	3rd	6th	Bright	Gray iridescent	Parallel plates	Thumb print patches	720° Up	Steel and irons
Free Ferrite	Very ductile	0.0	Dull	5th	7th	Bright	Very light	Polygonal grains on long etching	Grain boundaries show first	720° Up	Annealed Steel
Free Cementite	Brittle short	6.7	Bright	6th	1st	Bright	Dazzling white	Thin net or needles in steel	Grain boundaries Needles inside	720° Up	Hypersteel white iron
Graphite	Tender	100.0	Gray flakes	..	Softest 9th	Black long flakes	Grayish black	Flakes long fuzzy	Sometimes common centered		Gray cast iron
Slag	Brittle cold	0.0	Tiny black streaks	..	4th	Bluish grey	Bluish and spotted	Rounded or elongated spots	Streaks in longitudinal section		Wrought iron
Temper carbon	Spongy	100.0	Black heart	..	8th	Black spots	Black	Irregular splotches	Numerous inside; fewer outside	700° Long Time	Malleable castings

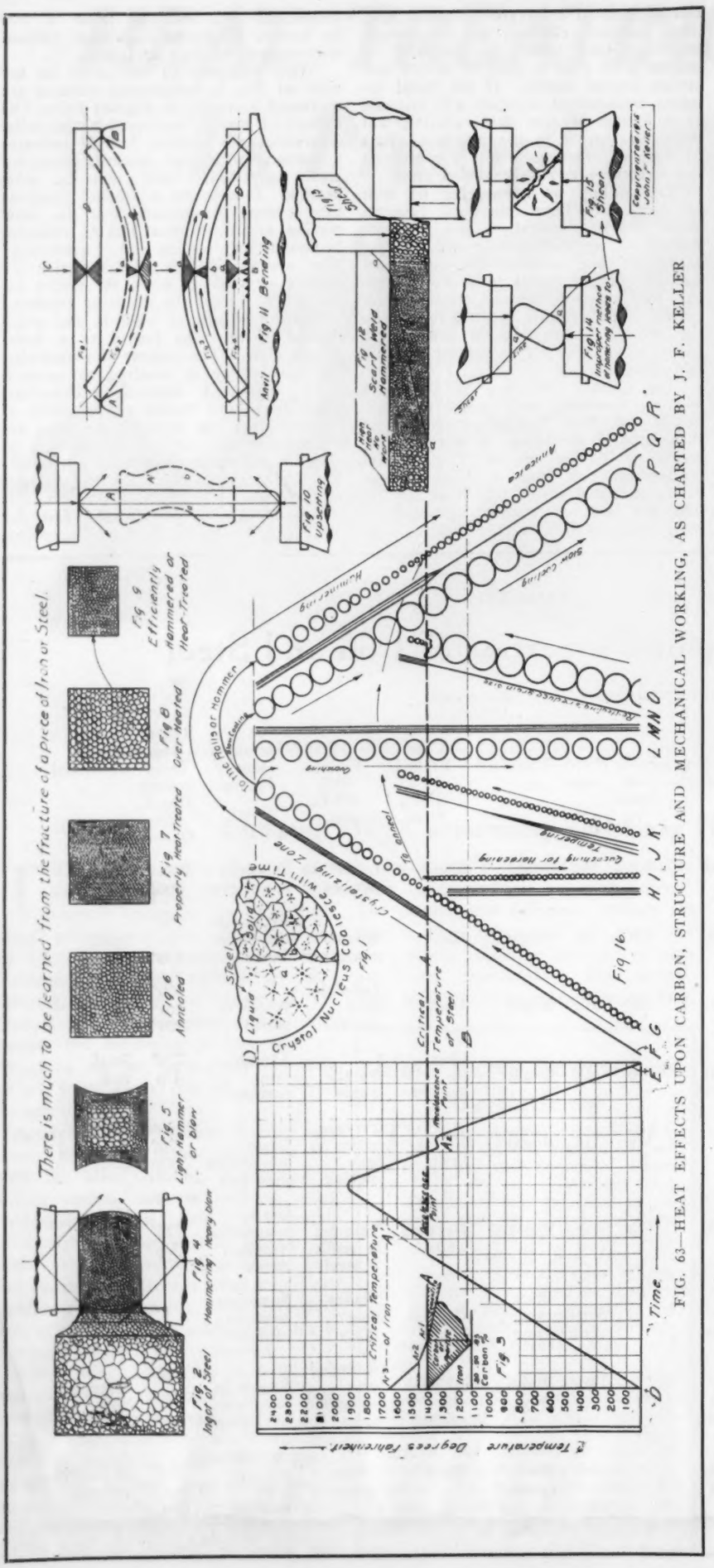

FIG. 63—HEAT EFFECTS UPON CARBON, STRUCTURE AND MECHANICAL WORKING, AS CHARTED BY J. F. KELLER

that with increased temperature the grains develop in proportion with temperature and time. The efficiency of rolled or hammered iron or steel depends upon the amount of reduction and the temperature at which the metal is laid down, indicated by following the line *R* downward, and efficient method of hammering as indicated in Fig. 4.

"Annealing of the above metals has three purposes; to relieve forging strains, uniformity of structure, and malleability. Heat uniformly to *A* and cool very slowly as indicated at *F, G* and *Q, R* Fig. 16.

"*F* and *G* show that as the temperature of annealed steel gradually rises, the carbon remains in a free or non-hardening state, until *A* is reached. This change is instantaneous in small stock, larger pieces requiring time in proportion to size. Structural changes occur likewise, requiring time, when the grains become as fine as possible for the material. If quenched from *A*, the steel will be exceedingly hard, with a fine silky structure—the ideal condition for hardened steel.

"The tendency to change hardening carbon is probably strong at all temperatures below *B*, as indicated at *J*, while *K* shows no change of structure. Therefore, a soft, tough and fine-grained steel, a desirable condition for properly heat-treated material. *G* shows that as the temperature increases above *A*, the structure becomes coarser in proportion with temperature and time until *D* is reached. If quenched from *D*, hard, coarse, and brittle steel is the result, an undesirable condition, indicated at *L, M*. if allowed to cool slowly from *D*, soft, coarse and hence brittle steel, as indicated at *P, Q*.

"If the above materials be reheated, they retain their coarse structure until *A* is reached, where, if given sufficient time, all pre-existing crystallization will be reduced as indicated by following the line *O* above *A*. The object of such reheating is to develop a uniform structure throughout the material, it should then be treated according to the requirements of the steel."

Hardening carbon is that contained in the martensite or troostite. The increase in amount of carbon by casing or carburizing gives an increase in hardening carbon upon quenching to harden, and the hardness of the hardening carbon seems to be greater when certain alloys are present. However, the plain carbon steels will be here dealt with principally, with perhaps a word as to changes necessary for alloys. Manganese, silicon, phosphorus and sulphur should be low, in plain carbon materials for our purpose. A method of selecting steels from miscellaneous lots will be given later in this chapter.

The object desired as a result of the casing and case hardening procedure is a hardness very great at the outside to resist continued wear. This hardness should decrease toward the central core, with a corresponding increase in the toughness and resistance to shock, which are absent in most very hard materials like the outside of the case. Every one knows that it is hard to break, by

a blow, even so brittle a material as a quartz boulder if it rests upon a softer "cushion." Therefore, if we can back up the hard case with a softer material to take up the force of the blow, we will prevent the shattering of the case.

The exception to the desirability of a *gradual* decrease in hardness comes in the class of objects which are "skin-hardened" or shallow hardened like the already high carbon tools in the previously mentioned "pack hardening" class. The greatest quantity of material belongs to the class with low carbon core, gradual increasing in hardness to the outside of the case. There are various ways in which we might get a hard outside and a softer inside core beside the case hardening process as we know it. If the piece is large enough in cross section, we may forge it from high carbon steel, then quench in water already warmed. The outside of the piece will harden and the inside heat contained will keep the center from hardening so much. We may hold the piece in the water and keep the outside cool until the inside has fallen below 200 degrees Cent., (392) when all danger of tempering the outside is passed. This process will be hard to regulate for all sizes, will give too little of a resilient cushion at the core, and will be impossible for small sections such as small automobile parts which urgently need case hardening.

Properties Other Than Hardness

There is the possibility of passing through a piece of hardening steel, an electric current just sufficient to temper the inside while the outside remains too cold to temper. This presents a great many practical difficulties and, as yet, has not been worked out satisfactorily. Every alternate method possible has been tried many times by various companies in the endeavor to get away from the old-fashioned case hardening, because it entails expenditure of considerable time. They invariably revert to the carburizing for the final solution of the problem, but incidentally bring out some interesting improvements on the old-fashioned methods of doing it.

Since the gradual increase in hardness from core to case is desired, increasing carbon content must be provided for in about the same ratio. If the latter is not accomplished, zones with abrupt boundaries are formed and circular cracks often follow these boundaries. This is termed "enfoliation." Some claim that to prevent enfoliation the case should be kept down in carbon, at least below 0.9 per cent, but the gradual variation now may be accomplished in other ways.

Many degrees of hardness are desired in different parts and pieces. A ball race should be slightly harder than the balls in the bearing, where the latter can be more easily replaced. Both may be case hardened. We may have the hardness of martensite or hardening carbon, or we may have hardness due to excess cementite, or both. We may have martensite of 0.8 per cent carbon or of 1.5 per cent carbon. Some parts need brittleness reduced to the limit possible, at a sacrifice of some hardness, so we quench or temper the case to troostite. Others need only the increased hardness due to the cementite in pearlite so we simply carbonize to 0.9 per cent without any quenching except that necessary for grain refining. Occasionally a case is made sorbitic for a purposeful strengthening and resiliency. It acts like an outside strong pipe filled with an inside softer material. Sorbite is not hard enough to take up much wear, like troostite or martensite.

Excess Cementite by Slow Cooling

Table XVI gives the properties of the various constituents as the science of metallography presents them. From it, we gather that cementite is the hardest constituent in a steel, and martensite is next. Free cementite only occurs in a hyper-eutectic steel, which must be cooled slowly from its upper critical or *Acm* point, to its lower critical or A_1 in order to give the maximum amount. As materials are cased by carburizing in pots mainly, it is natural to allow this slow cooling. The pots sometimes are allowed to cool in the furnaces, but generally are pulled from the furnace and cooled in air without breaking the seal or exposing the contents to the scaling action of the air. Thus the time is sufficient to permit a slow cooling and maximum of free cementite, but no other hard constituents.

The free cementite thus formed in the case is present at the grain boundaries and in needles throughout the grains of pearlite. It is found that the pearlite itself is so soft that it makes a poor bed for the hard free cementite, in all parts and pieces which have excessive wear. The wear rapidly takes out the soft pearlite by abrasion of the ferrite, leaving the isolated needles and boundaries of free cementite unsupported. The brittle cementite then breaks off in small fragments, defeating the purpose of a uniform wearing surface. For another reason, the structure as the material comes from the pots is very coarse-grained, due to high temperatures and long holding, resulting in increased shock brittleness for the whole.

Wilson Welder & Metals Co., 132 King street, New York, has moved its plant and general offices as of May 1 to the Wilson building, Hoboken factory terminal, Hoboken, N. J. Increased demand made larger quarters necessary.

Thomas Iron Sale

Transfer to Reading Iron Co. Completed and Property Divided

Details of reorganization and of various recent developments are announced as follows by L. E. Thomas, president of the Reading Iron Co. and of the Thomas Iron Co.:

The Reading Iron Co., April 21 formally acquired from Drexel & Co., Philadelphia, the stock of the Thomas Iron Co. Drexel & Co. took over this stock in July, 1922, as agents for the Reading Iron Co.

The Reading Iron Co. has sold to the Reading Co. its 40 per cent holding in the Catasauqua & Fogelsville railroad, a subsidiary of the Philadelphia & Reading railroad and its stock in the Ironton railroad, which was owned by the Thomas Iron Co., 50 per cent to the Reading Co. and 50 per cent to the Lehigh Valley railroad.

The total stock of the Reading Iron Co. now is owned by the Philadelphia & Reading Coal & Iron Co. This change became effective Jan. 1, 1924, when the segregation became effective, whereby the Philadelphia & Reading Coal & Iron Co. took over all coal and other properties which had been owned and operated by the Philadelphia & Reading Railroad Co., which now is known as the Reading Co.

While the stock of the Thomas Iron Co. is owned by the Reading Iron Co., it will continue to be operated as a separate corporation. Officers of the Thomas Iron Co. are: President, L. E. Thomas; vice president, J. M. Callen; secretary-treasurer, O. T. Case. Directors of the Thomas Iron Co., in addition to the officers, include W. J. Richards, S. R. Seyfedt and Randolph Stauffer.

The Thomas Iron Co. has disposed of the blast furnace and property at Hellertown, Pa. Most of the site has been acquired by the Reading Co., and the rest by the borough of Hellertown and individuals. The blast furnace is being dismantled by Henry Potts & Co., Philadelphia. The Alburtis furnace, Alburtis, Pa., sold some time ago by Butz Bros., Alburtis, is being dismantled.

Properties remaining with the Thomas Iron Co. include two blast furnaces at Hokendauqua, Pa., and the Richard mine at Wharton, N. J. The Richard mine is on the Mount Hope railroad, which connects with the Central Railroad of New Jersey. This mine, which has a modern concentrating mill, is shipping ore to Hokendauqua and Reading. In addition to the mining plant, the Thomas Iron Co. also owns a considerable number of miners' houses at Wharton and Hokenduaqua. Of the blast furnaces at Hokendauqua, one has capacity of 500 tons daily and is modern in every respect. It now is active and is producing merchant foundry iron and gray forge iron for the Reading Iron Co. The other furnace has capacity of 300 tons a day; it is modern excepting for the stack itself, and changes in the stack are planned.

E. Arthur Tutein, Inc., will continue to sell the merchant pig iron with Elbridge Walker in charge of sales. The Reading Iron Co. is placing in operation a new charcoal bloomary with a capacity of 200 tons of skelp daily for charcoal iron boiler tubes.

Supply and Machinery Men Meet

Three National Associations Hold Triple Convention in Cleveland—Problems Deal Largely with Methods To Increase Profits—Numerous Papers and Notable Addresses Are Presented—Officers Elected

REPRESENTATIVES of supply and machinery interests from all sections of the country were brought together at Cleveland May 19-21 during the triple convention of the National Supply and Machinery Dealers' association, the Southern Supply and Machinery Dealers' association and the American Supply and Machinery Manufacturers' association. Meetings were held at the Hotel Cleveland. Joint meetings were held in the afternoons but separate meetings were conducted during the mornings. With the exception of the National association, the morning sessions were open only to members and invited guests, although this association conducted a closed business meeting on Tuesday morning. A wide range of subjects were discussed during the three days.

The morning and afternoon sessions of the National association on Monday were in charge of the machine tool section with First Vice President L. H. Swind, Swind Machinery Co., Philadelphia, and chairman of the machine tool section presiding. Following opening remarks by W. J. Radcliffe, president of the association, Mr. Swind read the annual address of the chairman. With the credit situation the best in history and with a quieting of the political situation shortly, Mr. Swind believed business would revive in three or four months. One of the features of the address was a "proposed method of establishing true values of the so-called second-hand, slightly used and rebuilt machine tools." He suggested that the association establish a classification committee so that a buyer could be informed fully as to the characteristics of the used tools available. The suggested classification was as follows:

Class A. Strictly up-to-the-minute from a standpoint of standard machine tool or single purpose design. In other words, the former would take *Standard A* and the latter *Production A* classification. The term *standard* would apply to geared head and quick change feed design, while *production* would apply to single purpose machines, both of well-known and recognized makes.

Class B. All cone-driven designs or types.

Class C. Designs and types prevalent in 1914 or prior thereto.

This plan would require the co-operaton of all machine tool builders and full publicity in trade journals. Such a classification would be the means of preventing ill-advised purchases. He also urged the certification of sales engineers. In concluding, the speaker said "trade papers have been working diligently in behalf of our industry as best attested by the constructive character of their reading and advertising matter."

Selling problems were discussed during the balance of the morning. Appeals were made from dealers on the Pacific Coast and remote places that the manufacturers increase selling differentials. The association passed a resolution of sympathy and suggested that manufacturers give this matter thought when readjusting prices. The question of handling customers wishing to trade in used tools provoked considerable discussion. It was found that most dealers completely divorce their used and new tool business and used tools are taken in only where a profit can be made in their resale. It was reported that a Philadelphia interest is proposing an auction for used tools, this auction to be supported by machinery dealers. At the afternoon session it was pointed out that at the present time dealers are not carrying large stocks of new tools.

Conduct Executive Session

The Tuesday morning session of the National association was open only to members. At this time President W. J. Radcliffe, E. A. Kinsey Co., Cincinnati, presented the annual address in which he suggested the term "distributors" instead of "dealers" in the name of the society. Reports of other officers were given. Two papers were presented at this session: "Steps To Be Taken To Place the Supply Business on a Profitable Basis," by B. H. Ackles, T. B. Rayl Co., Detroit, and "Methods of Keeping Stock Records," by H. H. Kuhn, Hardware & Supply Co., Akron, O., and E. P. Welles, Charles H. Besly & Co., Chicago.

At the Wednesday morning meeting the National association discussed the advisability of changing its name to the National Supply & Machinery Distributors' association Decision was reached to conduct a referendum vote on the matter. This decision was reported to the officers of the Southern association and later similar action was taken by that organization. Resolutions were read on the deaths of E. E. Strong, formerly of Strong, Carlisle & Hammond Co., Cleveland, and Thomas A. Fernley, former secretary of the association. At the close of the session new officers were elected and installed.

Following a discussion on cash discounts and pipe tools and fittings at the combined meeting on Monday afternoon, Col. L. P. Ayres, vice president, Cleveland Trust Co., Cleveland, and a member of the Dawes reparation committee, addressed the meeting on "Conditions in Germany and the Dawes Plan." The speaker first pictured the economic and social conditions in Germany, then explained how the reparations committee went about to determine the plan that should be pursued. Ayres argued that the plan should be adopted and should be worked out on a definite basis with the full support of America.

Robert S. Binkerd, vice chairman, Eastern Railroads Presidents' conference, made an address on "The American Citizen and His Railroads." Mr. Binkerd pointed out that railroad welfare is essential to all people and that national prosperity requires railroad prosperity. American people are about 10 times more dependent upon railroad transportation than are the people of civilized Europe and three times more dependent than 20 years ago. He outlined briefly the operating difficulties of railroads and made a plea that the roads be given their fair share of the national income.

"The Value and Progress of Simplification" was the title of an address made on Tuesday afternoon by A. E. Foote, department of commerce, Washington. A number of lantern slides was used to show figures in industries where simplification has made considerable progress. Statistics showed that the reduction in the number of styles and sizes of various commodities has enabled manufacturers to reduce their production costs and to increase profits. In the majority of cases, the consumer receives greater satisfaction since products become more standard and may be replaced more conveniently and at lower cost. In closing, Mr. Foote placed at the disposal of the three associations and their members the service of the department of commerce in extending the simplification work to new lines. He also read a brief word of greeting from Secretary of Commerce Hoover. This address was followed by "Business Sense," an address by James Biggs, Hardwicke-Etter Co., Sherman, Tex., and president of the Southern Supply & Machinery Dealers' association. Briefly

Mr. Biggs outlined the business ethics which should be used.

Concluding this session, William Staniar, E. I. DuPont deNemours & Co., Wilmington, Del., read a paper "Protection to the Manufacturer, Jobber and Dealer by Standardization of Belting and Transmission Machinery." As a result of the extremely rapid growth of the Dupont company during the war, it was found that the maintenance of belting and transmission equipment was tremendous. Consequently an engineering force was put to work to make a systematic study of the subject. Belts have been tested under many conditions of service and various materials of different widths and thickness have been tried. As a result certain standards have been laid down and are adhered to strictly in the plants of the Dupont company as well as several of the automobile manufacturing plants of the General Motors Corp. Shutdowns caused by failure of transmission equipment have been greatly reduced and thousands of dollars have been saved in maintenance.

The newly elected officers of the three associations, and shown in the accompanying box, were introduced at the concluding meeting on Wednesday afternoon. "Does National Advertising Benefit the Dealer?" was discussed at some length by C. H. Stebbins, Jefferson Union Co., Lexington, Mass. Mr. Stebbins stated that national advertising is the function of the manufacturer rather than the distributor. It is imporant in decreasing sales resistance and consequently selling costs. Mason Britton, McGraw-Hill Co., Inc., New York, presented the final address, discussing with the aid of numerous lantern slides the "Buying Structure of Industry." In concluding, he showed statistics indicating that purchasers of industrial equipment prefer to see advertising in trade and business magazines rather than popular mediums. Uses and applications of equipment is information more desired by the reader than description of it.

Invitations for the 1925 triple convention of the associations were extended by Atlanta, Ga., and St. Louis, but the matter was referred to the conference committees for selection of the most desirable location.

Stove Founders Re-elect

All executive officers of the Stove Founders National Defense association were re-elected at the recent annual meeting of the organization at the Astor hotel, New York. George Mitchell Pittston is president; Joseph L. Anthony, Taunton, Mass., first vice president Lewis Moore, Joliet, Ill., second vice president; John A. Fry, Detroit, treasurer; and Robert W. Sloane, Scranton, Pa., general secretary. The following changes were made in the personnel of the district committee; in the second district. E. T. Harrison succeeds W. N. Jones, Richmond, Va., and Wm T. Myers, E. F. Hill, Peekskill, N. Y., in the third district, James Mitchell, Cleveland, succeeds James W. Dwyer, Detroit; and in the fourth, George Baker, Belleville, Ill., succeeds N. H. Burt, Leavenworth, Kans.

New Officers

NATIONAL SUPPLY AND MACHINERY DEALERS' ASSOCIATION

President
B. H. Ackles
T. B. Rayl Co., Detroit
First Vice President and Chairman Machine Tool Section
T. W. Carlisle
Strong, Carlisle & Hammond Co., Cleveland
Second Vice President
E. P. Welles
Charles H. Besly & Co., Chicago
Secretary-Treasurer
George A. Fernley
505 Arch street, Philadelphia
Advisory Secretary-Treasurer
T. James Fernley
505 Arch street, Philadelphia
Executive Committee
W. A. Somers
Somers, Fitler & Todd Co., Pittsburgh
J. C. Richardson
Queen City Supply Co., Cincinnati

SOUTHERN SUPPLY AND MACHINERY DEALERS' ASSOCIATION

President
J. L. Pitts
Brown-Roberts Hardware & Supply Co., Ltd., Alexandria, La.
First Vice President
George Winship
Fulton Supply Co., Atlanta, Ga.
Second Vice President
L. J. Larzelere
Farquhar Machinery Co., Jacksonville, Fla.
Secretary-Treasurer
Alvin M. Smith
Smith-Courtney Co., Richmond, Va.
Executive Committee
R. P. Lockett
A. M. Lockett & Co., Ltd., New Orleans
W. E. Gilkeson
Bluefield Supply Co., Bluefield, W. Va.
J. B. Rice
Hyman Supply Co., Wilmington, N. C.

AMERICAN SUPPLY AND MACHINERY MANUFACTURERS' ASSOCIATION

President
John C. Ruf
I. B. Williams & Co., Dover, N. H.
First Vice President
H. D. North
Ferry Cap & Set Screw Co., Cleveland
Second Vice President
W. R. Simpson
American Pulley Co., Philadelphia
Third Vice President
D. S. Brisbin
Columbus McKinnon Co., Columbus, O.
Secretary-Treasurer
F. D. Mitchell
1819 Broadway, New York
Executive Committee
M. B. Skinner
M. B. Skinner Co., Chicago
R. S. Carter
Whitman & Barnes Mfg. Co., Akron, O
C. B. Chancellor
Baldwin Tool Works, Parkersburg, W. Va.
A. C. Kingston
Mechanical Rubber Co., New York
R. B. Skinner
Skinner Chuck Co., New Britain, Conn.

Chicago Bearing Metal Co., Chicago, has increased its capital stock to $500,000 and 50,000 shares no par value.

See Good Business

Manufacturers Report Conditions Improving—Association Meets

Reflecting increasing co-operation and greater uniformity of purpose among business men, the twenty-ninth annual convention of the National Association of Manufacturers at the Waldorf-Astoria, New York, May 19-21, adopted resolutions condemning diversion of arsenals, navy yards and other govenmental establishments to manufacturing plants competing with private business urging adoption of a pending bill to codify and simplify laws relating to trademarks; disapproving submission of an amendment empowering congress to prohibit or regulate the labor of all persons under 18 years of age; opposing ratification of the international trademark convention and expansion of the patent office.

John E. Edgerton of the Lebanon Woolen Mills, Lebanon, Tenn., was re-elected president, Henry Abbott of the Calculagraph Co., New York, was re-elected treasurer and George S. Boundinot was re-elected secretary.

Returns from a questionnaire covering conditions during the fortnight just before the meeting, which brought 30,000 replies, indicated increasing business activity in the fall. Current trade in iron and steel was reported fair by 51 per cent, good by 20 per cent, excellent by 4 per cent and poor by 25 per cent. Prospects for fall business were reported fair by 63 per cent, good by 29 per cent, excellent by 1 per cent and poor by 7 per cent.

The following were elected vice presidents: Pennsylvania—J. W. Rawle, J. G. Brill Co., Philadelphia; Massachusetts—G. K. Simonds, Simonds Saw & Steel Co., Fitchburg; Illinois—Robert P. Lamont, American Steel Foundries, Chicago Connecticut—Clarence E. Whitney, Whitney Mfg. Co., Hartford Michigan—John Thix, American Injector Co., Detroit; Wisconsin—A. J. Lindemann, A. J. Lindemann & Hoverson Co., Milwaukee; Rhode Island—George H. Wilson, U. S. Bobbin & Shuttle Co., Providence; Indiana—H. C. Atkins, E. C. Atkins & Co., Indianapolis; Missouri—Harry Scullin, Scullin Steel Co., St. Louis; California—J. R. Miller, California Cotton Mills Co., Oakland; Tennessee—Fred Arn, J. M. Card Co., Chattanooga; and Alabama—H. T. De Bardeleben, De Bardeleben Coal Co., Birmingham.

The new directors-at-large are: William H. Barr, Buffalo; Hays H. Clemens, Erie, Pa., J. L. Kimbrough, Muncie, Ind.; E. B. Leigh, Chicago; A. H. Mulliken, Chicago; R. W. Nelson, Jersey City, N. J.

Confidence Spurs Tool Builders

Leaders Take Constructive Attitude in Discussing Problems of Machine Tool Industry—Analyses of Markets Attract Interest—Association Reports Progress in Simplification and Standardization Activities

CONSTRUCTIVE OPTIMISM unmistakably was the keynote of the twenty-second spring convention of the National Machine Tool Builders' association held May 22 and 23 at Buffalo. The meeting clearly demonstrated that despite the fact the industry has passed through several lean years and faces an immediate future of uncertain promise, its leaders are not down hearted. It showed that on the contrary they are building for the future, confident that fundamentally the machine tool industry is sound.

This confidence was discernible throughout the two-day program. President Flanders expressed it in his presidential address. It appeared in the general manager's report, permeated the inspiring words of Mr. Viall at the Thursday afternoon session and cropped out time and again during the meeting.

Progress was reported in many of the activities of the association, including standardizing catalog sizes, establishing a code of ethics for the industry, unifying cost accounting methods and improving relations with machine tool distributors. Much interest was displayed in the analyses of markets, three papers being devoted to this subject. Financial management also came in for considerable discussion, most of which was directed toward the specific topics of control by budget and methods of accounting.

The meeting was attended by nearly 80 members and guests. The arrangement of the program, providing as it did for ample time for the discussion of each paper and for a round table talk at the conclusion of each afternoon session, added much to the value of the convention. Group meetings of the builders of each class of tools were held Thursday evening. In point of interest and enthusiasm evidenced, the convention outranked any previous meeting of the association.

Stresses Importance of Technical Research

AS A general rule the business sessions of the conventions of national trade organizations lack interest, often because of the cut-and-dried nature of the proceedings. The first session on Thursday, while devoted almost exclusively to the reports of officers and committees, proved to be an agreeable exception.

In his presidential address, which was published in last week's issue, Ralph E. Flanders, general manager, Jones & Lamson Machine Co., Springfield, Vt., outlined some of the factors affecting the future of the machine tool industry. He referred to the prospects for business in the next few months as not better than "fairly poor," but his survey of the general outlook, extending into the future conveyed the spirit of studied optimism.

In commenting on the present state of business, E. F. DuBrul, general manager of the association, stated that based on the monthly average for the first quarter of 1920, orders for machine tools in the first three months of 1924 were 33.8 per cent as compared with 41.4 per cent during the corresponding period last year.

Purchases during the last year, declared Mr. DuBrul, seem to have been largely of high-production machines that made old processes obsolete by great reductions in the cost of doing work. Such machines attracted orders where none were to be had for standard machines of older types. In order to stay in business, asserted the speaker, machine tool builders must count it a necessary part of their operations to be designing newer and better machines. It is their job, he added, to transfer more and more skill and intelligence from their men into the machines they build.

Utilizing Excess Capacity

The big financial problem today is to decide what to do with the excess capacity that exists here and there in the industry. Mr. DuBrul mentioned new designs that will create new demand, a higher type of salesmanship, the manufacture of other products and consolidations of companies as possible remedies of the excess capacity situation. However, he warned, it is impossible to clear an oversupply of machine tools by bargain sales below cost.

The speaker stressed the importance of technical research and pointed to the fact that the cement industry, which supports an elaborate research organization, in 1919 produced cement valued at $175,000,000—an amount considerably below the $212,000,000 of machine tools built in that year. Mr. DuBrul also pleaded for more activity in the standardization of tool-holding and work-holding elements, and for the elimination of unnecessary sizes. He also touched on the activities of the association relative to regional meetings and conferences of the cost accountants of some of the member companies, the association's stand against the metric system and developments in the movement for a standard machine tool data sheet.

H. H. Lucas, Lucas Machine Tool Co., Cleveland, presented the report of the treasurer, after which a number of committee reports were submitted. As chairman of the conference committee, J. Wallace Carrel, Lodge & Shipley Machine Tool Co., Cincinnati, summarized the discussion at a joint meeting with distributors held on the preceding day. Progress was made, he reported, on the problem of dividing commissions on orders involving more than one dealer. A resolution, virtually amounting to a vote of confidence in the committee, subsequently was passed.

Following the presentation of com-

Put Information to Work

"In order to stay in business, the machine tool builder must count it a necessary part of his regular operations to be designing newer and better machines."

"An industry's problems are solved quickest and best by exchanging information, reporting experience as to successful and unsuccessful methods and cooperating in business and technical research."

"I plead for more activity and for definite programs of standardization of tool holding and work-holding elements. I plead for elimination of unnecessary sizes."

—From general manager's report, by E. F. DuBrul.

mittee reports, the second hand tool problem was discussed. The general manager outlined a suggestion made by L. H. Swind, Swind Machinery Co., Philadelphia, to the effect that machines be classified according to fitness, in order to facilitate the retirement of obsolete inefficient tools from the market. One speaker advocated a plan of placing values on old machines somewhat in accordance with the practice adopted by automobile manufacturers in appraising motor cars. A committee of three was appointed to investigate the used machine problem.

Describe Opportunities in Machinery Markets

REGARDLESS of how machine tool builders view the present status of the industry, those who attended the second session of the convention held Thursday afternoon must have been impressed by the business opportunities outlines by the three scheduled speakers.

W. A. Viall, secretary, Brown & Sharpe Mfg. Co., Providence, R. I., whose address is abstracted elsewhere in these columns, spoke in an inspirational vein and brought out some of the better aspects of business activities within the industry.

Harry Tipper, secretary, Class Journal Publishing Co., New York, presented an analysis of the machine tool market in the automotive field. An investigation of the inventories of automobile manufacturers, he said, showed that on Jan. 1, 1924 there were 413,409 machine tools in use in the automotive industry. After dividing this figure to show the number of machines of each kind in the industry, he presented estimates of the number of units required for replacement in 1925, 1926, 1927 and 1930, these estimates being based on the assumption of an average depreciation rate of 10 per cent. In the course of his address, Mr. Tipper developed the fact that there are 36,000 repair shops, 43,000 dealers and 47,500 garages in the distributing and maintenance branch of the industry. He declared that in the manufacture of passenger cars the tendency is toward the greater use of single-function rather than single-purpose machine; that in the truck industry the trend is toward a greater use of standard machines; and that in the production of the larger parts the use of special tools is expanding.

Analyzes Foreign Markets

W. H. Rastall, chief of the industrial machinery division, United States department of commerce, Washington, briefly surveyed the export market for American machine tools, and stated that indications seem to point to a period of three years in which European competition will not be very serious. He declared that American trade in Latin America and Australia is expanding, but that in Asia the reports for 1923 which have just become available show a serious decline. Mr. Rastall pointed out that the political upheaval in China is partly responsible for this condition. He also outlined the conditions existing in India which affect the importation of American machine tools.

In conclusion he advised manufacturers of production machinery and manufacturing tools to cultivate European markets, but not too expensively. Builders of general purpose machines, he said, should cultivate the non-European markets. Of greatest importance, he declared, is an improvement in the character of salesmanship.

Forecasting Sales in Advance

Financial problems are of special interest to machine tool builders because of the sharply fluctuating nature of their business. For this reason, the program of Friday morning's session, which included papers on control by budget and methods of simplifying cost accounting attracted close attention.

P. E. Bliss, vice president, Warner & Swasey Co., Cleveland, outlined a method by which practically all departments of the company are controlled by budget. Not only are the expenses of the engineering and production activities allotted in advance, but the probable volume of sales and collections is forecast so that a basis for the control of operations is established. Mr. Bliss explained how this plan had resulted in actual savings, and stated that by virtue of the planning ahead and careful control involved in carrying out the plan, the company had been able to predict a year in advance the profits of 1923 within about 5 per cent of the actual figure. J. C. Spence, Norton Co., Worcester, Mass., and C. Wood Walter, Cincinnati Milling Machine Co., Cincinnat and many others discussed the subject of budget control. While a great deal of good natured humor was injected into the discussion, the concensus of opinion clearly was that while at its best the budgeting of future receipts and expenses may be only refined guesswork, the best guess usually is predicted on reliable information relative to past experience.

H. P. Dix, secretary, Wilmarth & Morman Co., Milwaukee, described a system of simplified cost accounting which greatly reduces the number of office workers required to keep books. The plan provides for substituting average rates per hour for labor and predetermined rates of department overhead for the usual method of determining direct labor and overhead by tedious multiplication of hours and minutes by dollars and cents. Through the plan advocated, one clerk is able to handle the accounts for each 100 employes.

Mason Britton, vice president, McGraw-Hill Publishing Co., presented an illustrated address on the buying power of industry. He emphasized by means of charts the importance of the executive in specifying or approving expenditures for material and equipment and showed that in the majority of cases the production type of executive has the greatest influence in the selection and authorization of purchases.

Plant Layout Affects Expenses

At the final session on Friday afternoon, R. E. Flanders, manager, Jones & Lamson Machine Co., Springfield, Vt., described a rearrangement of equipment for making turret lathes by which numerous records, a considerable number of laborers, and confusion were eliminated. The first step, according to Mr. Flanders, was to separate repair work from production work. With the repair activities segregated in a separate department, the next step was to lay out the production department somewhat in accordance with the progressive assembly plan employed by automobile builders. By routing the material so that it passed from one side

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Enthusiasm in Business

"What every business needs is enthusiasm. No one ever complains of the high cost of golf balls."

"Some of us are apt to decry the present time as being of a kind that never has been before, but most of you are too young to remember about 1893 and the years following."

"No one can tell what the new developments of invention will be that will call forth a multitude of machine tools, but rest assured that whatever it is and whenever it comes machine tools will be found necessary and it behooves us to be ready to meet it."

"I hear the complaint from time to time that competition is a good deal stronger than it used to be, but as I look back and remember some of the things that our fathers had to contend with, I assure you that their paths were not always paths of pleasantness, nor were they paths of peace. While our present competition may be stronger, we are stronger to work at it."

—From address of W. A. Viall.

Steel Treaters Discuss Problems

American Society for Steel Treating Conducts Spring Sectional Meeting at Moline, Ill.—Metallography, Forging, Welding, High Speed Die Treating, Grinding and Malleable Iron Manufacture Given Attention

PROGRESS in the heat treatment of steel was ably and forcefully delineated at the spring sectional meetting of the American Society for Steel Treating at Moline, Ill., last Thursday under auspices of the Tri-City chapter of the society. Papers dealing with the heat treatment of dies, steel under the oxyacetylene flame, drop forgings, reduction in the period of annealing and magnification of metallography were read and discussed with Dr. George K. Burgess, director, bureau of standards, Washington, and president of the society, presiding. A dinner in which the Tri-City Technical council participated and at which Dr. Burgess was the chief speaker terminated the Thursday session while Friday was given over to a golf tournament and plant visitation in the Tri-City district.

A one-day malleable is within the possibilities of laboratory demonstration, declared Dr. Anson Hayes in a paper prepared jointly by him and W. J. Diederichs, both of Iowa State college, Ames, Ia. Their paper was entitled "Possibilities of Producing Malleable Iron and Intermediate Products in Short Annealing Periods." Their paper in part was:

"Our previous work showed that it required about 3 hours at 1700 to 1800 degrees Fahr. to absorb massive cementite completely. This work also showed that the absorption of this cementite was much slower at the lower temperature used in the commercial process. It is essential that all massive cementite be absorbed before cooling starts and that the cooling be so regulated that no grain boundary cementite be precipitated as the temperature falls to that of the lower critical.

"Having eliminated all free cementite for all temperatures above the critical, a further condition for obtaining complete graphitization is that the rate of cooling through the critical be retarded sufficiently to avoid the formation of pearlite. It is well known that this final cooling rate is 10 to 11 degrees Fahr. per hour as a maximum. With these facts in mind the following treatment was used for shortening the cycle for complete graphitization. Ten standard ½ inch tensile test bars were placed on end, unsupported and unpacked, in a hump-type furnace whose temperature was 1700 degrees Fahr. The temperature was dropped to 1200 degrees Fahr. and it required 40 minutes for it again to reach 1700.

"This temperature was maintained for 3 hours and it was then lowered to 1560 degrees Fahr. for 1 hour. Then the cooling rate was reduced so that the bars cooled uniformly and slowly to 1320 degrees Fahr., which required 14 hours or at the rate of 17 degrees per hour. At this time the rate was further reduced to 10 degrees Fahr. per hour so that the bars cooled to 1200 degrees Fahr. in an additional 12 hours. The process was considered complete when 1200 degrees Fahr. was reached, and it will be noted that the complete overall time was within 31 hours. It has been shown that the iron-carbon eutectoid for white cast iron lies at 1419 degrees Fahr. and that it is easily undercooled to about 1320 degrees Fahr. Therefore, in the above experiment the 10-degree cooling rate was not used until a temperature of 1320 degrees Fahr. had been reached. Three of these bars were tested with the following results:

Tensile strength Lbs. per Sq. In.	Yield point Lbs. per Sq. In.	Elongation % in 2 In.
48,000	30,200	14
45,500	30,400	11
48,200	30,900	12

Dr. Hayes went in detail into the principles which underlie the control of properties when graphitization is only partially completed. He pointed out that grain boundary cementite tends radically to reduce ductility. He said it is imperative that the high temperature be maintained until all massive cementite is absorbed and further, the cooling down to the critical must be so regulated as to avoid the formation of shell cementite. Combined carbon in excess of that to form pearlite will result in undesirable physical properties, he advanced.

Discusses Treating of Dies

"Heat Treatment of High Speed Steel Dies" was the subject of a paper by C. B. Swander, metallurgist, Wagner Electric Corp., St. Louis. He said in part:

"With the increasing use of high speed steel for dies the steel treater has been compelled to improve the hardening practice. Only dies of the simplest forms can be ground on all sides after hardening. Fully 95 per cent are made to finish dimensions before hardening. This means that the hardener must treat such work without scaling, blistering or distorting to any marked degree. The average steel treater finds this difficult to do if he gives the recommended practice treatment. The process to meet these requirements found both practical and economical and within the scope of the average size hardening room follows:

"Inspect the crucibles and lids to see that the lids fit tightly. Put about ¾ inch of a mixture of one-half charcoal and one-half silica sand in the bottom of each. On this place a dish of graphite made from a crucible lid. Preheat two of the graphite crucibles and lids in the preheating furnace to 1500 to 1600 degrees Fahr. and one of the crucibles with a tight fitting lid in the high heat furnace to 2500 degrees Fahr. One of the preheated crucibles is now removed from the furnace. The work to be hardened is inserted. The crucible and contents are returned to the preheating furnace. As soon as the work is preheated to 1500-1600 degrees this crucible is removed and the one in the high heat furnace removed and the work quickly transferred to the high heat crucible. The lid is carefully put in position and the crucible and work which it has just received placed in the high heat furnace held at 2200-2300 degrees Fahr., depending on the composition of the steel, for a predetermined time, which naturally varies with the dimension and weight of the work, varying from 5 to 15 minutes. Ten minutes is satisfactory for all but extremely light pieces and pieces 1-inch through or over.

"The crucible and contents are now removed from the high heat furnace, the lid is removed and the work quickly quenched in a good grade of quenching oil. When cooled to about 150-200 degrees Fahr., it is transferred to a hot tempering oil bath maintained at 400 degrees Fahr. for 10-15 minutes, then finish drawn in a salt bath for about 20 minutes at 1100 degrees Fahr. Then it is cooled in oil. The salt film is now dissolved off in hot water and the die allowed to cool in air. By using two crucibles for preheating, the cycle becomes continuous. Always have preheated work ready for the high heat crucible when it is empty. If the work is light, one preheating crucible often is sufficient. The dies come out remarkably clean, free from all blistering and scaling, all sharp cutting edges in perfect condition and with little dimensional changes."

Prof. A. S. Kinsey, of the Stevens Institute of Technology, Hoboken, N. J., spoke of the advances made in welding in a paper entitled "Steel Under the Oxyacetylene Flame." The fact that oxygen can now be made 99.5 per cent pure for commercial purposes, he declared to be a real achievement. Fusion rather than plasticity is now the basis of oxyacetylene welding and the limits of welding have therefore been extended from wrought iron and steel to all the other metals of the ferrous group and to those of the nonferrous group. In the oxyacetylene flame may be found a range of temperature from 6300 degrees Fahr. at the cone tip to 2300 degrees at the end of the envelope —a space of only 1½ inches. He said:

"Almost any source of high temperature will melt steel, but it may have been accomplished at the expense of the refined condition of the grains and the

possibility of restoring the heated metal to its original granular structure and strength. The ideal flame for heating steel is that which will create about the hot metal such an atmosphere that the reassembling of the grains may be accomplished without interference from oxides or changes in the chemical elements."

How the Wyman-Gordon Co., Worcester, Mass., inspects and stocks steel was told by J. H. Nelson, metallurgist for the company. Physical tests, chemical analyses and microexaminations are made before bars are accepted and stocked. The bars then are assigned to the work for which they appear best fitted. Although heat treatment is run on every consignment of steel, steel received one day can be alloted for use the following day. On these test heats all experimental work is done on 2½-inch rounds, according to Mr. Nelson. Some steel responds in a small section but is found to have no hardening capacity in a larger section, thus steel that might be used for automobile front axle would not do for a crankshaft. First class forgings result only from the use of first class bars. If a defect in the bar is deep seated it will be forced out at the flash line. Bars with hair-line seams running to the surface should be rejected. Mr. Nelson stated that at the Wyman-Gordon plant all bars are sheared to make possible a shear inspection, which reveals pipe. If one bar of a heat shows pipe this applies, as with effervescing steel, to all bars from that heat.

High Magnification Desirable

In a paper entitled "High Power Magnification in Metallography," R. G. Guthrie, metallurgist, Peoples Gas Light & Coke Co., Chicago, took exception to the assertion that there is no more to be seen at 5000 diameters than at 1000. High power photography is necessary and essential, he said, but the question arises as to how high the power should be. Each day it becomes more necessary that the magnification figures carry such data as will conclusively prove just how they were obtained. Mr. Guthrie pointed out that a magnification of 5000 diameters may be arrived at by using a 5-millimeter objective with an ocular having an initial magnification of 2.6 and a 1000-millimeter camera bellows extension, or it may be arrived at by using a 2-millimeter oil immersion objective with the same ocular but having only a 450-millimeter camera bellows extension, or it may be further arrived at with a 2.2-millimeter objective using the same ocular and a 500-millimeter camera bellows extension, or it may be arrived at by using a 4-millimeter objective with a 6-diameter ocular and a camera bellows extension of 500-millimeters. Still further, it may be obtained by using an 8-millimeter objective with a 10-diameter ocular and a camera bellows extension of 500 millimeters.

Views depicting the manufacture of various types of abrasives and working illustrations of the adaption of abrasives to various kinds of work constituted the paper of H. W. Dunbar, Norton Co., Worcester, Mass. At the dinner in the evening William Butterworth, president, Deere & Co., Moline, Ill., presided as toastmaster. W. H. Stackhouse, general manager, French & Hecht, Davenport, Ia., gave the address of welcome. Dr. Burgess exhibited slides showing the work of the bureau of standards and its relation to industry. Mr. Stackhouse predicted that the present constitutes the most competitive period business has ever experienced in this country but that normal business should shortly be restored.

Business Outlook

For Pipe and Supplies Dealers Encouraging—Association Meets

A symposium on the business outlook was one of the leading features of the fifteenth annual convention of the National Pipe and Supplies association in Cleveland, May 22-23. J. J. Kennedy, general sales manager, National Tube Co., Pittsburgh; Walter E. Watson, general sales manager, Youngstown Sheet & Tube Co.; J. W. Oliver, vice president, Standard Sanitary Mfg. Co. and Charles K. Foster, American Radiator Co., were some of the speakers. They were gusts of the jobbers. The substance of their statements was that the statistical position of the trade never was better, and the outlook for business in the near future is good. Fundamentals are sound, they reported, but a lull is noted at this time due to the fact that weather conditions have been unsatisfactory and that politics have had an unsettling effect.

Walter Gordon Merritt gave an interesting description of the new era in industrial relations. A nationally-known expert on the subject, Mr. Merritt declared that several United States Supreme Court decisions in the last few years have established clearly the rights and responsibilities of employers and employes. He said that over 8,000,000 shares of industrial stocks in the United States have been subscribed by employes, and that in some instances the special profit-sharing dividend feature of such participation has proved more effective than ordinary profit-sharing plans. Over 1,000,000 employes are working under employe representation plans; several hundred employe mutual benefit associations are active.

Col. Leonard P. Ayres, vice president of the Cleveland Trust Co., gave an account of the work of the Dawes committee in Europe, with which he was identified.

Half of each day's time was devoted to executive sessions. It was reported that the volume of business in the trade in the first few months of 1924 was equal to that in 1923. Some of the members stated that there are very good prospects of this year's business being equal to that of 1923. A plan to improve nationally the resale policy of manufacturers of cast iron and malleable iron fittings was discussed, and also the question of whether the association should develop a code of ethics. E. L. Bowman, educational director, National Trade Extension bureau, a co-operative body in which members of the trade participate, urged that more attention be given to the training of apprentices.

Election of officers resulted as follows: W. E. Clow Jr., president; M. W. Dennison, Boston, first vice president; W. C. Hanson, Washington, second vice president; George L. McIlvane, Pittsburgh, secretary; Isadore Weil, Chicago; A. L. Taylor, New York City and H. W. Strong, Cleveland, executive committee.

Interprets Strike Clause

New York, May 27.—A seller of merchandise cannot take advantage of a strike clause in a contract to excuse delay and delivery unless it can be shown that efforts were made to prevent the strike. This was decided by a jury before Supreme Court Justice Burr last Friday. If the ruling is upheld by the higher courts, it is expected that present forms of contracts will be revised. The court said:

"The strike clause does not mean that whenever a strike is threatened or occurs, the seller may abandon all effort to avert it and fold his hands until such time as lower wages may prevail, or until such time as the strikers may give in."

Ford Seeks Duluth Dock

Duluth, May 27.—An offer of $650,000 cash is reported to have been made by Henry Ford for 21.2 acres of bay front land here for dock purposes. It was also agreed by Ford to pay $8500 accrued taxes on the property, which is assessed at $307,675. The offer was made to creditors of the Maynard Coal Co., Columbus.

Delta Screw Machine Products Co., Delta, O., has been placed in the hands of receivers, Carl F. Orth and J. C. Paxson. Assets are estimated at $110,000 and liabilities at $105,000. The Bryant Pattern Works, is operated by the Delta company under lease.

Purchasing Agents Standardize

Specifications for Scrap Iron and Steel, Alloys and Other Material Adopted for Year at Convention of National Association in Boston—Sanctity of Contracts Discussed—Attendance Is Large—Exhibition a Feature

A GROWING appreciation of the responsibility resting on the shoulders of buyers characterized the ninth annual convention of the National Association of Purchasing Agents, in Boston, May 19-23. The growth of this organization has surprised even its enthusiastic members, and the convention, with its 2500 delegates, brought to public attention more than ever before the importance of organized purchasers.

The purchasing agents tentatively adopted for a period of one year a standard form of pig iron contract; standard specifications covering scrap iron and steel, ferrosilicon, ferromolybdenum, ferrotitanium, manganese ore and tool steel. A standard contract for fuel oil purchase also was adopted tentatively.

The following officers were elected: A. G. Hopcraft, Ferro Machine & Foundry Co., Cleveland, president; George C. Bestick, Heald Machine Co., Worcester, Mass., treasurer; W. L. Chandler, New York, secretary; vice presidents at large, Chandler A. Steele, Philadelphia, A. G. Hopcraft, Cleveland, G. B. Ivey, New Orleans, Blaine Gavett, Grand Rapids, Mich.; George C. Bestick for New England, Fred J. Arthurs, east of Ohio, except Pittsburgh, C. G. Jones, Canada, D. E. Ferguson, Ohio, Michigan and Pittsburgh, John C. Dinsmore, Ohio to the Mississippi river, R. N. Miers, Mississippi to the Rocky mountains, and C. J. Rogers, Pacific coast.

Buyers' and Sellers' Problems Discussed

FOLLOWING visits to industrial plants in and around Boston Monday, May 19, and an informal dinner that night, the convention got under way Tuesday morning with a welcome by Boston's mayor, after which Pierre Casgrain, representing Canada, told of the close co-operation between Canadian and United States purchasing agents. He said the scope and opportunity for the buyers has greatly extended in the last 10 years, and is going to continue to develop because of new economic forces that change the complexion of industrial problems. To buy carefully, he said, is to stabilize business.

More than 2000 members were present when the president, Charles A. Steele, H. K. Mulford Co., Philadelphia, presented his annual report and started the business of the convention. Tuesday and Wednesday were devoted to group sessions, frequently combined with luncheon and dinner meetings. In the iron and steel group, headed by G. W. Sanborn, United Engineering & Foundry Co., Pittsburgh, the discussion centered around contract difficulties encountered by buyers and sellers. A standardized form of pig iron contract has been before the association for several years, and this year after much discussion and some modification, the contract was tentatively adopted for a period of one year.

A series of standard specifications covering scrap iron and steel, tool steel, ferrosilicon, ferrotitanium, and ferromolybdenum had been prepared during the year by an association committee working in co-operation with committees from the American Railways association, the National Association of Sheet & Tin Plate Manufacturers, the Waste Material Dealers association, and the United States bureau of standards. These specifications were discussed separately at the group meetings and with few alterations were all adopted for a period of one year at the Friday morning general session.

Would Make Contract Real

At the iron and steel group's dinner Wednesday night, John A. Penton, Cleveland, brought up the question of "When is a contract a contract?" After considerable discussion on the part of purchasers and iron and steel producers, he suggested that a committee be appointed by the association to meet with a similar committee, which he felt certain would be appointed by leading steel producers to discuss the general subject of contracts. Such a joint meeting of committees, Mr. Penton thought, would bring about a quicker and better understanding of the problems of buyers and sellers than could be secured in any other way. The sentiment of the meeting was unanimously in favor of such a joint committee.

Frank Purnell, vice president, Youngstown Sheet & Tube Co., laid aside his prepared paper on the steel industry in the war and described present day difficulties encountered by steel producers. He also emphasized the point that every buyer is a seller, and questions favoring one group must favor another.

C. E. Stone, Chain Belt Co., Milwaukee, discussing Mr. Purnell's talk, said that in a rising market the consumer with a low price contract is approached frequently by the producer for additional tonnage at a higher level in order to offset the low price material. Other purchasers had had this same experience and some stated that low price material in a rising market was almost invariably slow in delivery. Mr. Purnell said that the matter of delivery in active periods is an important consideration and the buyer to protect his rights is justified in paying a premium to secure delivery when there is no other method.

The discussion brought out considerable difference of opinion. George A. Pohlar, Cosden & Co., Tulsa, Okla., said that he felt a contract should be lived up to explicitly, including time of delivery, acceptance by buyer, and price. He said that rigid adherence to the contract conditions would eventually react to the benefit of producer and consumer.

E. J. Lowry, metallurgist, Hickman, Williams & Co., Chicago, presented a paper on what the purchasing agents should consider in buying pig iron. It is no longer advisable practice to buy this commodity merely on its silicon content. He outlined the effects of various chemicals on the quality of castings. The chief point was that silicon could be high or low in the pig and yet the castings could be soft or hard in either case, depending upon factors in the melting practice. Carbon content, he said, is more important in determining hardness or softness of castings than silicon content. He urged purchasing agents to think a little less of the price and a little more of the quality of material bought.

E. Fred Cullen, president, Johnson Edu-

cator Food Co., Cambridge, Mass., presented a paper on the careful study of standards, in which he said that responsibility for a tremendous loss was placed on careless purchasing agents. Careful buying frequently is more important in cutting down the amount of waste than anything that can be done by works engineers and modern machinery.

At the fuel conference L. F. Leighton, of the New England Wholesale Coal Dealers association, advised purchasing agents to buy coal at the present time. In 1921, he said, more than 65 per cent of the coal output of the country was produced at union mines, but since then the union has sustained serious losses in West Virginia and elsewhere, and as a result the nonunion mines probably could supply 60 per cent of the current coal demand. If the union fields continue to lose tonnage to the nonunion fields at the present rate, said Mr. Leighton, it will mean a hollow victory for the miners consisting of a high wage scale and relatively little work.

T. W. Harris, Jr., E. I. Dupont de Nemours & Co., speaking on the subject of coal versus fuel oil, stated that the consumption of fuel oil now is one-ninth greater than that of coal. Word from Herbert Hoover received at the convention advised the purchase of coal during the spring and early summer.

Robert S. Binkard, vice chairman, committee on public relations, eastern railroads, speaking before the general session on Thursday, analyzed the position of the railroad in the present industrial system. Our present economic civilization, he said, is dependent upon railroad transportation. Every producer and consumer is a member of the great economic society and as such is in constant danger of being upset by unwise agitations from groups who do not yet understand the laws of economic health. National prosperity, he said, requires railroad prosperity. Railroads today are the largest corporate consumers of the products of other industries. In a normal year they take about one-third of the coal output, one fourth of the lumber output, one third of the steel output, and one half of the fuel oil output of the country. One family out of every six was dependent on the railroads for its living in 1923. Undue stress has been placed on the question of freight rates. In reality our present rates are surprisingly low when all factors are considered, and represent but a small part of commodity cost.

The entire space in Mechanics Hall auditorium was occupied by the Informashow with a great diversity of exhibits. The Cleveland Twist Drill Co. had an attractive booth showing a complete line of twist drills together with a drill press operated as demonstration of drilling speed. The Wallace Barnes Co., Bristol, Conn., showed an assortment of springs from those which could scarcely be seen up to 24 and 30-inch springs for heavy work. Brown & Sharpe Co. had an attractive exhibit of small tools and in addition had photographs of all of its machine tool products. The Graton & Knight Mfg. Worcester, Mass., Charles A. Schieran Co., New York, and the Chicago Belting Co. had attractive displays of belts and belt drive systems. General supply exhibits were numerous and attractive.

Confidence Spurs Machine Tool Builders

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of the shop, through the different machining departments, past inspection points and finally to a line assembly at the other side, it was possibly to keep the material required for each sub-assembly within the confines of such a limited area that it was possible to dispense with all stock or work-in-process records. Experience with the plan, stated Mr. Flanders, has indicated that the cost of overhead has been reduced considerably, that the work of foremen is simplified, and that the work of routing and trucking is practically eliminated.

Cost System Developed for Associations

Washington, May 27.—The department of manufacture of the Chamber of Commerce of the United States announces the development of a new plan for the conduct of cost accounting activities within individual industries. E. W. McCullough, manager of the department, says:

"It is of importance that the members of any manufacturing industry develop cost accounting principles, which when applied by individual members of the industry will result in correct costs. Where there is an adequate knowledge of cost, competition is on a better informed basis, and all parties at interest, the manufacturer, his customers and his employes, gain.

"Heretofore activities within trade associations in connection with cost accounting have been carried on without a background of experience, and with no time tested plan available that will make success certain."

The plan is now ready, as set forth in three pamphlets prepared by the department of manufacture under the general title of "Uniform Cost Accounting in Trade Associations." No. 1 is under the title, "Organization of Activities," No. 2, "The Work of the Cost Committee," and No. 3 "Acceptance and Installation." All three divisions of the plan now are available.

Orders Equipment for New Structural Mills

Involving an expenditure in excess of $1,000,000, a contract for steel mill electrification equipment has been awarded to the Westinghouse Electric & Mfg. Co. by the Carnegie Steel Co. for a new structural mill being erected in the Homestead, Pa. group. The equipment to be installed in the new mill consists of large turbine-generator equipment for furnishing electric power, complete driving equipment for three units of the structural mill, and a large amount of auxiliary equipment. These electrical units will take the place of steam-driven units formerly used.

The large turbine-generator will be installed in the power house of the Carrie furnaces, across the Monongahela river from Munhall, where the new structural mill is being erected. The power unit will be added to generators already installed in order to supply current to the new electrification equipment. The current will be carried across the river on an overhead system to a sub-static in the mill.

Some time ago the Carnegie company decided to dismantle three of its oldest structural mills in Munhall, and replace them with two large mills with electric drive. This contract is the first half of this electrification program.

To Increase Stock

Stockholders of the American Rolling Mills Co., Middletown, O. at a recent meeting approved a proposal submitted by the board of directors to increase the common stock of the company from $20,000,000 to $30,000,000. The stockholders also re-elected the following directors for another year as follows; George M. Verity, R. C. Phillips Frank M. Simpson, J. M. Iseminger J. M. Hutton, W. S. Horner Samuel Goodman, J. M. Frantz, C. K. Hook, Paul Sturtevant and James P. Orr. Action in increasing the capital stock of the company was decided upon by the directors, Feb. 14, 1924 Stockholders were informed that there was no need for any new capital in the company, the purpose of the increase being to permit resumption of issuance of stock dividends from time to time It is the understanding that a 4 per cent annual stock dividend for 10 years is contemplated by the directors under the plan ratified by the stockholders.

Launchly Foundry & Machine Co., Jackson, Miss., has increased its capital stock from $50,000 to $75,000.

Brief Flays Pittsburgh Base

Federal Trade Commission's Summing Up Calls It Plan to Maintain Uniform Prices—Declares Supply and Demand Not Factor in Practice—Compares It As Logical Successor of Earlier Pools and Price Fixing Methods

WASHINGTON, May 27.—Charging the present Pittsburgh plus method of basing steel prices is the fourth plan of steel producers within a generation to fix and maintain uniform prices of steel at Pittsburgh, with the addition of freight rates to consuming points, the brief of federal trade commission counsel in the Pittsburgh plus case declares that the Pittsburgh basing point method should be sent into history. The brief, which has just been issued, comprises more than 400 printed pages reviewing testimony and discussing the complaint issued by the federal trade commission against the United States Steel Corp. and its subsidiaries April 30, 1921, concerning the Pittsburgh base method of quoting prices. The testimony in the case comprised more than 20,000 typewritten pages. The report of J. W. Bennett, examiner for the trade commission, recently was completed, but was not made public, in accordance with rules of procedure of the trade commission.

"There promises to be a fifth plan if and just as soon as this fourth plan is weeded out by the government," says the commissions brief." W. S. Horner, president of virtually all of the sheet and tin plate manufacturers in the United States, except the respondents, who merely co-operate, said that if Pittsburgh plus is eliminated something else will be devised shortly afterward to take its place. But we shall not cross that bridge until we come to it; we aim, however, to tear down the one which carries Pittsburgh plus."

Declaration is made that the records in the case show the admission of "practically all iron and steel producers," called as witnesses by both the federal trade commission and the United States Steel Corp., that they sell on the Pittsburgh plus system generally and that their salesmen are positively prohibited from changing the prices given them.

The brief, which was prepared by Attorney K. E. Steinhauer, declares that exhibits of the commission show that the ratio of production of rolled steel by the eastern and western mills, respectively, to the total production of the country from 1907 to date has been practically identical. It is further declared that Chicago has never been dependent on Pittsburgh for a single pound of steel, any more than Pittsburgh has been dependent on Chicago and other sections for steel.

Criticizing the argument that the Pittsburgh plus method resulted from the law of supply and demand, the brief says:

"Where respondents' buffoon defense of supply and demand originated is a question. Certainly not with Judge Gary. When he gave all the reasons for the Pittsburgh plus system at Duluth and later at Washington before this commission he did not charge supply and demand as being responsible for the system."

It is asserted that Pittsburgh plus prices are not prices made in good faith to meet competition. The brief declares that Pittsburgh plus functions similarly to its predecessors, "the pols, price-fixing trade meetings and Gary dinners" in boom times. It is stated that in times of booms some of the smaller companies will refuse to sell the same kind of steel that the corporation sells, including steel to be delivered at the convenience of the mill but only will sell steel for immediate delivery because it commands a higher price. It also asserts that steel producers do not object to this, and states that if these companies do sell the same kind of steel as the corporation does, according to the testimony, they can get no more than the corporation does for it.

The brief charges numerous disavowals in the testimony of the answer of the respondents and says that steel users constantly are menaced with increased discriminations due to Pittsburgh plus. Ability of the western user to compete east of Chicago is destroyed, it is maintained, except where the steel is a small factor. It is alleged that the western manufacturer who employs bronze or cast iron in a product goes clear to the Atlantic coast while the same manufacturer who employs steel in another product cannot sell that steel product "east of the city limits of Chicago."

With the burden of Pittsburgh plus resting over Duluth and Minneapolis, contends the commission's brief, and the burden of the Birmingham differential over New Orleans and Chattanooga and the burden of both resting over countless other points, the steel users find their growth so hampered "they cannot develop into large manufacturers."

"The word 'extortion' is used in the complaint," says the brief, as defining Pittsburgh plus exaction. "The respondents in their anwers have taken, we feel, unwarranted umbrage to the term. We do not mean that the Pittsburgh plus operation is performed from any mere desire to hold up the customer, as Mr. Topping so well explained before the Stanley committee in 1908. It is only used by the steel producers that they may reach uniform Pittsburgh plus practice; secure extra profits to the companies outside of Pittsburgh, and the reciprocal privilege to Pittsburgh plants doing business all over the country and the world. Therefore, to extort, as used in the commission's complaint, simply means as Webster says, 'to wrest from an unwilling person by an undue exercise of ingenuity.'"

"Pittsburgh plus prices alone are not self supporting," it is declared. "In the days of the pools and price fixing trade meetings and Gary dinners, Pittsburgh plus prices were the most important but not the only part of the agreements or understandings; the extras constituted a part; the fantastic uniform contract provision another part; the uniform freight rate book formed another part and so on. All of these parts now constitute the Pittsburgh plus system."

Caustic in some of its comments on testimony submitted by the Steel corporation, the brief also makes some pointed and sarcastic references to the "famous co-operative Gary dinners" mentioned in the Steel corporation dissolution suit in 1913, which the brief alleges were price fixing meetings.

"It is absurd for respondents to allege in their answers," says the brief, "that these steel companies seldom adhere strictly to the Pittsburgh plus system and then to have the producers testify that their sales agents are given positive instructions that they cannot deviate from the Pittsburgh plus prices given them under any circumstances as to some, and in other cases, certainly not without consulting the home office.

"Many other witnesses testified that their agents had no authority to cut the prices, in addition to those referred to in the statement of the case, among whom were John F. Hazen, general manager of sales, of the Pittsburgh Steel Co.; William M. McFate, vice president of the Trumbull Steel Co.; John Follansbee, vice president of the Follansbee Bros. Co.

"Charles M. Schwab, of the Bethlehem Steel Co.; William H. Donner, of the Donner Steel Co.; John A. Topping, of the Republic Iron & Steel Co.; A. C. Dinkey, of the Midvale Steel & Ordnance Co.; Leopold Block, of the Inland Steel Co., and a dozen other steel producers all admitted they sold generally on the Pittsburgh plus system.

"Not only do these steel producers sell at Pittsburgh price plus the freight, but they all sell at the identical Pittsburgh price plus the freight."

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

ONE of the most modern and completely equipped freight car repair plants in the South will be constructed by the Southern Pacific railroad on its site at Englewood, Houston, Tex. Work is expected to commence on the construction shortly, a total expenditure of about $500,000 being involved. The main shop building will be 400 feet long. It will have a shop and mill building adjoining, 40 x 208 feet. The latter will be devoted to car repairs. Another shop will be constructed for preparing and assembling wheels and axles. It will be equipped with boring mills, lathes and wheel presses. All the principal shop machines will have individual electric drive while small tools will be operated by compressed air. An air brake testing and repair shop, store and supply buildings also will be constructed.

* * *

A CONTRACT has been awarded the J. G. White Engineering Corp., 43 Exchange place, New York, for constructing of a 33,000-volt power transmission line for the Staten Island Edison Corp., St. George, Staten Island, N. Y.

* * *

THE Lakewood Engineering Co., Cleveland, has received an order from the state of Michigan for 13½ miles of riveted narrow gage track with presses steel ties, 900 batch boxes for handling materials, 450 cars, seven road finishing machines, 12 subgrading machines, 60 tunnel traps and miscellaneous items.

* * *

PLANT construction recently was completed for the newly incorporated Ferguson Gear Co., Gastonia, N. C. A complete line of gear cutting machinery is installed. Manufacture of gears of various types soon is to be started. Richard Ferguson is president and treasurer, R. S. Ferguson, secretary and John Kreusler, plant manager.

* * *

NO FURTHER equipment purchases are contemplated now by the C. & G. Foundry & Pattern Works, Indianapolis, in connection with its consolidation of pattern shop and foundry departments. At a future date the company will be in the market for additional equipment to increase the foundry production and to handle all classes of brass, bronze and aluminum castings. Extensions are planned for the near future. Charles J. Gisler is president and Fred D. Crider, secretary and treasurer.

* * *

WISCONSIN METAL PRODUCTS CO., Racine, Wis., manufacturer of hardware specialties, metal stampings, deep drawings, dies, etc., is constructing a steel and brick plant, 100 x 246 feet, saw tooth construction. The plant will be ready for use August 1. Most of the equipment needed for the enlarged quarters will be moved from the old plant. Taylor Jellippe is secretary and treasurer of the company.

* * *

CAPITAL stock of E. H. Odom Bros. Co., Atlanta, has been increased from $25,000 to $250,000, and the plant is being enlarged for the manufacture of a newly invented machine for reboring motor cylinders, patented recently by E. H. Odom, president of the company. The company has purchased an additional site on Edgewood avenue, in Atlanta, where the enlarged plant is to be located.

* * *

WAVERLY OIL WORKS CO., 5450 Fifty-fourth street, Pittsburgh, manufacturer of oils, greases and lubricants, hereafter will sell mine lubrication through the following mill and mine supply houses in that city, Frick & Lindsay, Pittsburgh Gage & Supply Co., Colonial Supply Co., and Somers, Fitler & Todd. It will continue to distribute its products direct to its present customers but generally sales of its industrial oils and greases will be handled through the new channels.

* * *

MANUFACTURE of high grade custom bodies for automobiles will be undertaken as soon as construction of a 3-story plant at Michigan boulevard and Thirty-seventh street, Chicago, is completed for the Graff Motor Coach Co. In addition to the manufacturing, the company will do general repair work. W. W. Graff is president.

* * *

CONTRACT for the construction of a sugar refinery at Tokyo, Japan, for the Dai Nippon Sugar Mfg. Co. of that city has just been awarded the Honolulu Iron Works, Honolulu, Hawaii. The machinery and equipment of the proposed plant will cost $990,000. An additional $200,000 will be spent in erecting necessary buildings. Practically all of the sugar machinery for the refinery will be manufactured at the Honolulu plant of the Honolulu Iron Works. The Honolulu Iron Works is at present at work on an order for sugar mill machinery and equipment for the Central Vertientiez of Cuba, to cost $2,000,000; for the Central Bacolod of Philippine Islands, to cost $750,000, and for additions to other mills.

* * *

SEVERAL buildings and additions to the plant at Sharon, Pa., of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., now are under construction. The new group will consist of several 1-story plants, the largest containing 157,000 square feet of floor space. Cranes of 75-ton capacity will be installed. A 4-story reinforced concrete and steel building also is to be constructed. American Bridge Co. is furnishing the steel construction and Stone & Webster, Inc., have general charge of other phases of the building.

* * *

ILLINOIS TOOL WORKS, 154 East Erie street, Chicago, manufacturer and designer of cutters, hobs and reamers, is constructing a plant at 2501 North Keeler avenue. A 1-story, steel and brick constructed plant containing approximately 60,000 square feet and costing about $350,000 is being built. The Illinois Tool Works will produce high speed steel milling cutters, hobs and special tools in the new plant. Tuckey & Jenkins, 400 North Michigan avenue, Chicago, are architects for the plant. No further expenditures for operating equipment are contemplated at this time.

* * *

NO PURCHASE of additional equipment is contemplated at present by the Des Moines Steel Tank Co., Des Moines, Ia., manufacturer of steel stock and storage tanks, troughs, baskets, etc., which recently purchased the T. Lennox Co., Marshalltown, Ia. The stock, patents, etc., of the Lennox company were acquired and the entire equipment moved to Des Moines. Additional equipment is expected to be purchased when present expansion plans are put into effect. No change in executive personnel of the Des Moines company resulted from the acquisition of the T. Lennox Co. John H. Albrecht is president and manager of the Des Moines Steel Tank Co.

Baruch Criticizes

Gary's Account of Suggestion to Nationalize Steel Industry

New York, May 27.—Challenging the accuracy of Elbert H. Gary's statement to the Iron and Steel institute concerning the proposed federalization of the steel industry during the war, Bernard M. Baruch, who was chairman of the war industries board, vigorously denies the inference "that it was a gigantic communistic scheme" concocted for no reason at all. Mr. Baruch says the proposal to take over the steel industry came when the industry sought to hold out for high prices. Mr. Baruch's statement in part follows:

"I regret that remarks of Judge Gary before the institute bring to public attention unnecessarily a very unpleasant incident of the war in connection with that part of the steel industry for which he was the spokesman. I regret also that his statement contains many inaccuracies which the record controverts.

"Reading Judge Gary's recital, one would be led to assume that the steel industry, for no reason at all, had been threatened with and finally saved from a gigantic communistic scheme. Here are the facts as I know them:

"Almost immediately after the declaration of war, at the request of the President, I met representatives of the steel companies in the office of Elbert H. Gary, 71 Broadway, New York, more particularly in reference to the price of ship plates, which they fixed at 4½ cents a pound, assuring me they knew that would be satisfactory to the government.

"I urged them not to insist upon that price, because it was too high and unfair in the circumstances. They could not see my point, although later in the evening I again met Judge Gary and made the same request, to which I got the same reply.

"Following a conference at Washington in July, which both Judge Gary and I attended, it was decided to await the conclusion of an inquiry into prices of steel which the federal trade commission was making. This brought about a meeting on Sept. 21 on the subject. Previously the war industries board had passed a resolution declaring that 'if the steel interests should not be willing to give their full co-operation because of the prices fixed, the war industries board would take the necessary steps to take over the steel plants.' This was the first official intimation of the 'federalization' to which Judge Gary refers vaguely as having come 'in the fall of 1917 or the spring of 1918.'

"Based on his familiarity with conditions in the steel industry, and on the conclusions of the federal trade commission inquiry, J. Leonard Replogle, director of steel for the war industries board, together with Alex Legge and L. I. Summers, also of the board, had prepared a schedule of prices for the guidance of the board prior to the meeting on Sept. 21.

"This schedule fixed the price of steel plates at 3 cents a pound, the necessity for this having been demonstrated by the fact that a few days previously a very large tonnage of steel plates was sold by one of the steel companies to one of the associated governments at 14 cents a pound, a hitherto unheard of price.

"This schedule, as prepared by Mr. Replogle and adopted by the war industries board (of which Judge Robert S. Lovett was then acting chairman) at a joint meeting of the war industries board and representatives of the steel industry, was submitted Sept. 21, 1917. At an all-day meeting the steel representatives, led by Judge Gary, stood out for a higher price than that fixed in the war industries board schedule. After adjournment Judge Gary suggested to me privately that we ought to get together on price. This we did that very night, but the price was practically that fixed in Mr. Replogle's schedule.

"While we had excellent co-operation on the part of the steel industry as a unit, there were some individuals in it who could not at first entirely subordinate commercialism to war needs. And the President informed me if the war program was being delayed or if it could be accelerated by putting any industry entirely under government control this would be done. I did not think this necessary at that time and in this position I was supported by Mr. Replogle and all of my associates.

"Full of Inaccuracies"

"The only other time the subject of federalization was discussed in my recollection was at a meeting of the 'war cabinet' in Washington in the summer of 1918, subsequent to the conference in September, 1917. This was a general discussion of taking over all industries by the government. On this occasion the steel industry, like all other industries, having accepted the price schedules and regulations of the war industries board, and being in satisfactory co-operation on that basis, I opposed any further steps along this line. By this time I had become chairman of the war industries board. I must say for the steel industry and Judge Gary that, after having finally been induced to co-operate they did it generously and thoroughly.

"To say the least, Judge Gary's recital of the situation is full of inaccuracies.

"So far as William G. McAdoo is concerned, there is no basis whatever for Judge Gary's intimation that the federalization suggested came from him. It arose as a result of a general demand, affecting all industries and predicated upon just such difficulties as the government had with Judge Gary and those whom he represented at the beginning of the price-fixing era. I came to the conclusion then, and have since been strengthened in the belief, that in times of such emergency as war it is necessary and right to conscript men, money and materials for the national service. Call this what you will—federalism or nationalization—it does not mean permanent government operation of industry, as Judge Gary's account would indicate that it means, requiring every unit of the nation to do its share of the public service when public safety is threatened."

Gary Replies

To Baruch's Narrative — Reiterates Statements Made to Institute

New York, May 27.—In response to requests from newspaper representatives, the following statement is made by Elbert H. Gary with respect to Bernard M. Baruch's criticism of his remarks to the Iron and Steel institute last Friday:

"The public will probably not be interested in what I might say concerning Mr. Baruch's statement referring to my recent address before the Iron and Steel institute. It seems apparent that Mr. Baruch had not read my address in full. It was respectful, not controversial, and was accurate.

"The first meeting of the general committee with the war industries board took place when Judge Lovett was chairman. After a day's session without arriving at an agreement the war industries board adjourned, but, as Mr. Baruch states, I asked the board to remain in an adjoining room for a short time, and later in private conference, at which I remember Judge Lovett was present and also Mr. Legge, who was very efficient and helpful, we agreed upon the price of $3.25, I think, for plate and also upon other prices, all of which were later approved by the President.

"As I remember, our committee next met the board when Mr. Scott was chairman. We then agreed upon prices after considerable discussion and some disagreements at first. About three months later probably, we met the board when Mr. Willard was chairman and then agreed upon prices for the next three months. At that meeting Mr. Willard suggested that there had been considered the propriety of the government taking over the steel industry, and he made the promise that the steel men would be given previous notice of any further consideration of the subject.

"Still later the chairman of the general steel committee received notice to appear in Washington to discuss the subject of taking over the steel industry by the government, as I described in my address, and with the result mentioned. The steel industry had been co-operating, satisfactorily to both sides apparently, with the war industries board for many months before the question of taking over the industry was brought up for consideration and determination. If there had been previous discussions in Washington with reference to this subject the steel men were not present nor informed.

"If anything was said in my address concerning this matter or any other which offended any one, I very much regret it. As to whether or not the secretary of the treasury suggested it, it was expressly disclaimed there was any knowledge on the subject, and positively asserted there was only a report in circulation to that effect. If he cares anything about it, he will probably deny that he made the suggestion. If so, he will find no one in the steel industry to dispute him. I feel very certain if he had made the suggestion, based on any information received, he would not be ashamed of it. It would, of course, have been a great calamity if the steel industry had been actually taken over by the government."

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

ARTHUR G. HOPCRAFT, purchasing agent of the Ferro Machine & Foundry Co., Cleveland, was elected president of the National Purchasing Agents association at its recent convention in Boston. Mr. Hopcraft was vice president of the national association last year. He was general convention chairman of the 1923 convention held by the national association at Cleveland, and served two terms, in 1922 and 1923, as president of the Cleveland Purchasing Agents association. Mr. Hopcraft has been connected with the Ferro company for the past 10 years. Previous to that time he was in the purchasing agents' department of the Peerless Motor Car Co., Cleveland, where he was connected for five years. He had been associated with the W. Bingham Co., Cleveland, before joining the Peerless company.

* * *

H. J. Burkey has resigned his affiliation with the Pittsburgh office of the Eastern Fuel Co., effective May 10.

* * *

Thomas Vickers, formerly secretary of the British Cast Iron Research association, has resumed his consulting practice with offices at 14 New street, Birmingham, England.

* * *

Charles C. Burstein, recently placed in charge of the office at 2216 Farmers Bank building, Pittsburgh, of the Erie Iron & Steel Co., Erie, Pa., formerly was connected with the home office at Erie.

* * *

C. Harold Wills, president and general manager of Wills Sainte Claire, Inc., recently sailed for London. Mr. Wills has gone there on invitation of two British metallurgists for conference on developments he has made in the field of metallurgy.

* * *

C. D. Price, for many years connected with the Industrial Works, Bay City, Mich., builder of cranes, at its home office, has been appointed district sales manager of the company in its St. Louis district, with offices at Railway Exchange building.

* * *

Arthur T. Forsyth of the plant at Buffalo, N. Y., of the Buffalo Forge Co., that city, has been placed in charge of an office recently opened by the company in Seattle, to serve the territory of Alaska, and the states of Oregon, Idaho, Montana and Washington.

* * *

John R. Myers, of Russell & Co., Massillon, O., has been made chairman of the tractor and thresher department of the National Association of Farm Equipment Manufacturers, with headquarters at 608 South Dearborn street, Chicago. He succeeds G. H. Bathrick, of the Nichols & Shepard Co., Battle Creek, Mich. L. H. Bloom, of the Hart-Parr Co., succeeds E. C. Merwin, of the Russel company as secretary.

A. G. HOPCRAFT

* * *

Dr. E. S. Moore of the University of Toronto, Toronto, Ont., has been engaged for exploration work this season by the Ontario department of mines. He has taken charge of a party of four making a geological survey of the new iron range in the Mississanga Forest Reserve.

* * *

Harry Zimmerman, for 18 years secretary and treasurer and director of the Henkel-Clauss Co., Fremont, O., manufacturer of shears, has resigned after disposing of his stock in the company to Paul E. Schaaf, his business partner. Zimmerman and Schaaf organized the company in 1906.

* * *

George F. Anglin, formerly associated with the Pittsburgh Knife & Forge Co., Pittsburgh and Coraopolis, Pa., has been appointed Pittsburgh manager of Blake & Johnson Co., Waterbury, Conn., and will have full charge of sales of cold strip mill apparatus for that company in the Pittsburgh district and Ohio territory.

* * *

Frank C. Woods, general manager of the Woods Engineering Co., Alliance, O., has disposed of his interests in the company to some of the other stockholders.

Robert Hoierman succeeds him as general manager of the company. The Woods Engineering Co. manufactures machinery, specializing in automatic grinders and automobile jacks.

* * *

H. N. Schreuder has been appointed eastern sales representative for the National Engineering Co., Chicago, manufacturer of sand mixers and other foundry equipment. Mr. Schreuder will have his offices at 50 Church street, New York. He succeeds R. J. Richards who has been transferred to the Pittsburgh office as representative in that territory.

* * *

Walter C. Hauck, for the past year connected with the sales organization of A. W. Dow, San Francisco, Pacific coast representative for Apollo Steel Co., and the Donner Steel Co., has resigned and has assumed his old duties with W. S. Wetenhall Co., reinforcing bar jobbers, Seventeenth and Wisconsin streets, San Francisco.

* * *

L. D. Albin, formerly general sales manager of the Ingersoll-Rand Co., 11 Broadway, New York, has been elected vice president in charge of European sales for that company.

D. C. Keefe, formerly assistant general sales manager of the Ingersoll-Rand Co., has been appointed to succeed Mr. Albin as general sales manager.

* * *

C. W. de Garmo, for the past three or four years Seattle representative of Apollo Steel Co., has resigned and has joined the organization of Wm. P. Horn Co., San Francisco and Los Angeles, Pacific coast representative for the Mansfield Sheet & Tin Plate Co., Mansfield, O. He will make his headquarters at the Mansfield company's offices in the Wilcox building, Los Angeles.

Battle on Wage Fundamentals

Sheet and Tin Plate Makers in Conference Resist Amalgamated Attempt To Raise Bases for Compensation—Union Would Escape Effect of Declining Prices, Profit More by Advances—6-Hour Day Also Demanded—Many Mills Affected

BY A. J. HAIN

APPROXIMATELY 45,000 workmen who are members of the Amalgamated Association of Iron, Steel & Tin workers are interested directly in demands pertaining to wages and hours made by the association. Conferences begun at Atlantic City this week by representatives of the Amalgamated and of the employers with whom it has agreements, however, concern many more employes. While about 25 per cent of the hot mills of the country have union agreements, approximately 60 or 65 per cent in all are governed more or less by them. The United States Steel Corp. and some of the independent sheet and tin plate manufacturers have wage scales which vary much like those of the Amalgamated scales, though the companies have no relations with the association.

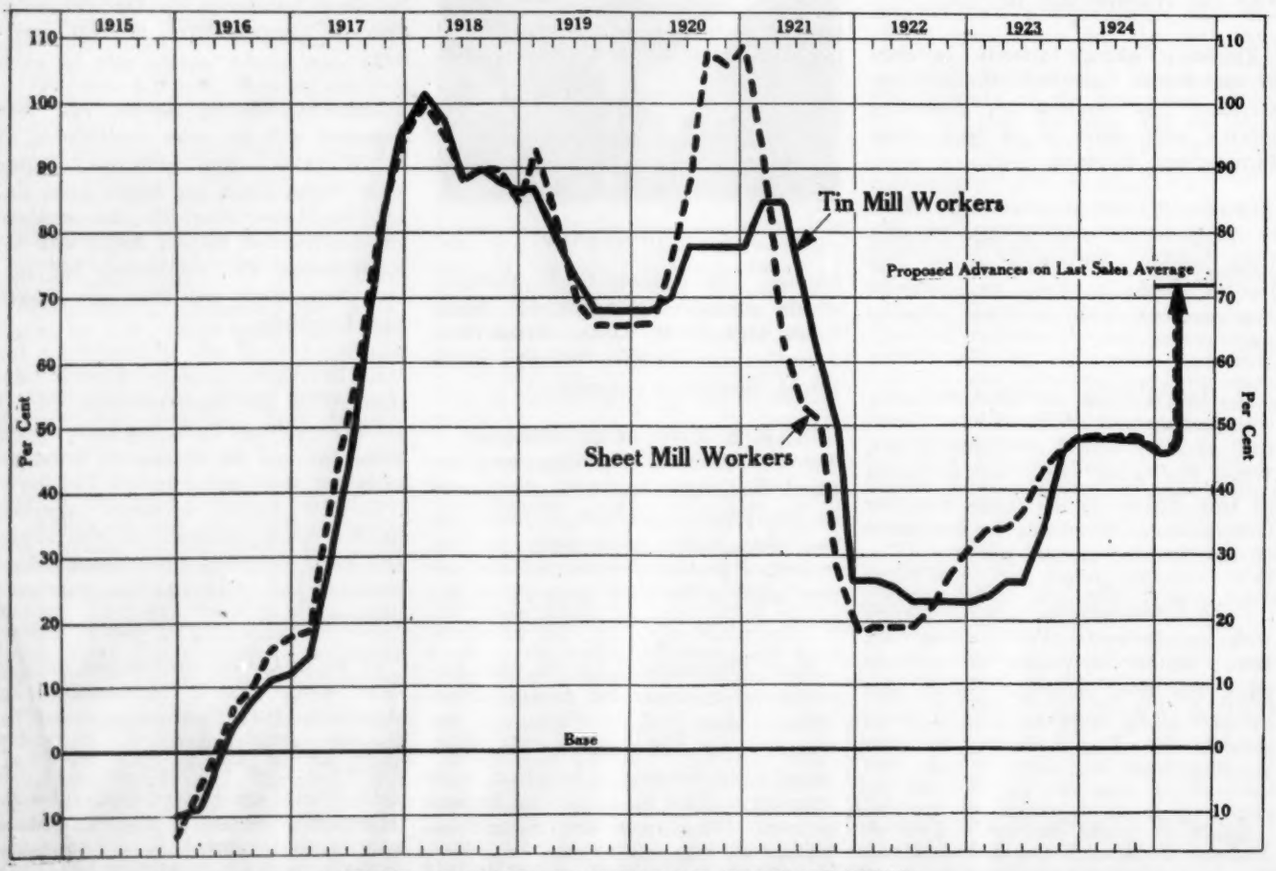
The first of the conferences which were to begin Dec. 27 pertains to the sheet and tin plate mill wages, hours and working conditions. The mills having contracts with the Amalgamated are represented in the Western Sheet & Tinplate Manufacturers association. Some of the members of this association who were to be represented at the conference in Atlantic City are the American Rolling Mill Co., Empire Rolling Mill Co., Follansbee Bros. Co., Falcon Steel Co., Sharon Steel Hoop Co., National Enameling & Stamping Co., Trumbull Steel Co., Republic Iron & Steel Co., Mahoning Valley Steel Co., Waddell Steel Co., Thomas Steel Co., and N. & G. Taylor Co.

The writer is editorial representative at Cleveland of IRON TRADE REVIEW.

About 25,000 members of the Amalgamated association are employed in the sheet and tin plate mills represented in the manufacturers' association, the other 20,000 being employed in the mills represented in the Western Bar Iron association. Conferences between the Amalgamated and the latter association will follow those of the Amalgamated and the sheet and tin plate manufacturers.

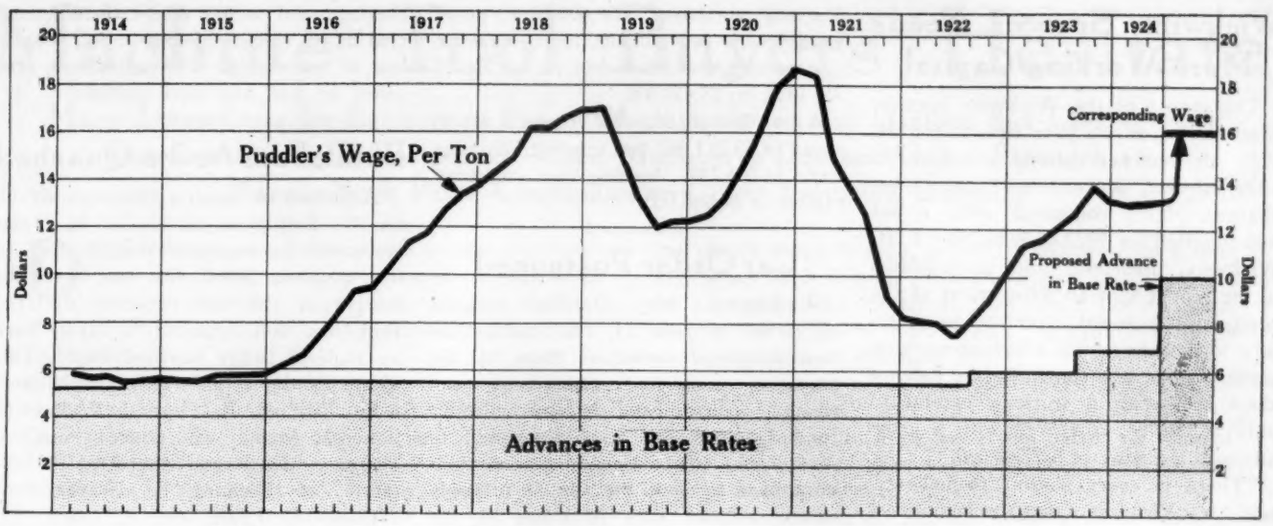
Thirty-four separate demands are made by the Amalgamated pertaining to wages and work in the sheet mills, and an equal number for the tin plate mills. In brief, they would require sheet and tin plate manufacturers to advance wages 25 per cent over present levels. Also, it is demanded "That the hours of work shall be no more than six hours per day, and not more than 21 turns per week" in sheet and tin plate mills. This is a significant clause, as the present agreement which expires June 30 specifies eight hours per day.

Since about 25 per cent of the sheet



TREND OF WAGES IN SHEET AND TIN PLATE MILLS

This chart expresses changes in wages in percentages. By granting the tin plate mill workers' demand last year to be placed on the same base for calculating wages as sheet mill workers, employers gave them a wage advance of 10 per cent. The Amalgamated now proposes changes that would net sheet and tin mill workers an average of 25 per cent advance in wages



TREND OF WAGES IN BAR MILLS

The Amalgamated association proposes that the base for calculating the puddling rate be advanced 43 per cent. On latest computation of average sales price this would have the effect of raising puddlers' wages 23 per cent. It would be a definite, and perhaps permanent, step to a higher bases of compensation, and would offset for them the loss that would otherwise follow a decline in sales prices

and tin plate capacity is represented in the association, and as the market demand is light, the other mills could readily supply the requirements. The association mills could be shut down, if necessary. The majority of the members of the committee named to represent the Amalgamated are said to be conservative. The average roller earns $20 to $30 a day, and it is believed that the conservative element will be disposed to move cautiously. The demands represent resolutions adopted at the Amalgamated association's convention, and the resolutions offered by radicals as well as conservatives went through. They represent the basis for negotiations. It is obvious to the association's leaders that not all the demands could be granted, and it is evident to the employes that the most important of them cannot. The employers apparently are determined to resist all, except those pertaining to minor adjustments between scales of some departments.

How Wages Are Determined

The wages in sheet and tin plate mills are determined by average sales prices of Nos. 26, 27 and 28 gage black sheets, in relation to a theoretical base price. This base price is $2.15. For each variation of 5 cents per 100 pounds in the actual sales price, there is an increase or decrease of 1½ per cent in wages. The association proposes to change this to 2 1/3 per cent. In the bi-monthly period, May-June, the wages were 46½ per cent above base, while if figured on a 2 1/3 per cent gradation, they would be 72 per cent above the starting point.

The accompanying chart illustrates the trend of the sheet and tin plate mill wages since uniform sales figures were compiled by the associations in 1915.

The tin plate mill wages formerly were figured similarly, but with a different base, that is $3.50 per 100 pounds of coke tin plate, and a variation of 1 per cent for each 5-cent increase or decrease in actual sales price. Last year the men asked to be put on the same basis in every respect with sheet mill workers; this was granted, and the effect of it was to give them an advance in their wages of 10 per cent.

The general plan of figuring wages according to sales prices of products has been found to be useful to employes and employers and is believed to have avoided much friction. Now, however, there is manifest a tendency on the part of the Amalgamated to take advantage of a period wherein comparatively low sales prices prevail to demand a change in basic figures. When prices recover, their wages will be correspondingly higher, and out of line with others. These are points that are emphasized by the manufacturers.

The same applies to the demands that have been made on the Western Bar Iron association. Practically all of the bar mills west of Pittsburgh are in this association, and eastern mills have similar arrangements, though not unionized. The relations between the union, and western mills have existed since 1893. The advances and declines in puddlers' wages illustrated in the accompanying chart are typical of bar mill wages in general. The theoretical base price for boiling bar iron was $5.25 in 1914, and it was advanced to $5.50 in 1915. It remained at this level until 1922 when it was raised to $6. It was advanced to $7 in 1923, and now the Amalgamated proposes to advance it to $10, or 43 per cent. The effect of this would be to increase their present wage about 20 per cent. For some other classifications of bar mill workmen the Amalgamated demands advances of 15 per cent over the present scales. The composite effect of all the demands relating to bar mill wages would be to increase present wages 10 per cent.

Some of the bar mills that will be represented at the conference with the Amalgamated are Interstate Iron & Steel Co., American Car & Foundry Co., Ft. Wayne Rolling Mill Corp., Ohio Falls Iron Co, Ewald Iron Co., Highland Iron & Steel Co., Kansas City Bolt & Nut Co., Lockhart Iron & Steel Co., Sellers Mfg. Co., Tyler Tube & Pipe Co, Pittsburgh Forge & Iron Co., and A. M. Byers Co.

April bookings of the Allis-Chalmers Mfg. Co., Milwaukee, approximated $2,000,000, an increase of 20 per cent over March.

Fluctuations in Sheet Mill Wages

(Percentages Below or Above Base. Dating from July 1, 1923, tin mill wages have been on the same bases as sheet mill.)

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
Jan.-Feb.	...	Base	37.5	96.0	82.5	75.0	64.5	19.5	34.5	48.0
March-April	...	7.5	52.5	88.5	70.5	87.0	54.0	19.5	37.5	48.0
May-June	...	10.5	69.0	90.0	66.0	108.0	51.0	22.5	43.5	46.5
July-Aug.	...	16.5	85.5	90.0	66.0	106.5	28.5	27.0	46.5	...
Sept.-Oct.	—13.5	18.0	96.0	85.5	66.0	109.5	18.0	31.5	48.0	...
Nov.-Dec.	— 7.5	19.5	100.5	93.0	66.0	90.0	19.5	34.5	48.0	...

Wickwire Spencer Needs More Working Capital

The report of the Wickwire Spencer Steel Corp. for the year ended Dec. 31, 1923, showed net income of $351,353 after interest, depreciation and other charges. This compared with a net loss reported for 1922 of $840,264. T. H. Wickwire, president, told stockholders in the report that an adjustment of the company's financial structure is necessary to provide it with adequate working capital. This was shown by the balance sheet indicating a working capital of only $4,119,984, compared with a gross business last year of $27,500,000.

"There is every reason to believe," said Mr. Wickwire, "that the business is essentially sound and that it has a very large potential earning power which can be realized if the stockholders and creditors will co-operate in such a plan."

The company's financial condition became acute in the last part of 1923, but banks extended their loans in order to give interested parties an opportunity to solve the financial difficulties. The general balance sheet of the company shows working capital of $4,119,984, which, it is asserted, is not sufficient for the volume of business now being transacted. Inventory is valued at $8,488,785 but there is only $305,276 cash on hand. Accounts receivable aggregated $2,278,261, but on the liabilities side "notes payable" are listed at $4,198,288 and "gold notes" at $1,730,500.

The consolidated earnings statement for 1923 shows gross sales of $27,548,268 against $17,574 in 1922 and net operating profits of $2,840,531 against $973,102 in the previous year. After crediting other income and allowing for bond interest, depreciation reserves and other charges, net income was $351,353 for 1923, against a loss of $840,264 after the same deductions in 1922.

Otis Profits Less

Net profits of $174,072 are reported by the Otis Steel Co., Cleveland, for the first quarter of 1924. This compared with $248,959 in the corresponding period of 1923.

Production of finished steel products in April of this year was about 26,000 tons. Both production and shipments of finished steel in this month were about 34 per cent greater than in April, 1923.

The income account for the March quarter of this year and last compares as follows:

	—First quarter of— 1924	1923
Gross profit	$706,622	$631,942
Total income	353,092	419,911
Net profit	*174,071	248,959

*After interest but before depreciation.

During the first quarter of 1924, the company purchased $216,000 first mortgage bonds for sinking fund, reducing first mortgage bonded debt as of March 31, 1924, to $9,434,000.

As of March 31, 1924, current assets stood at $9,213,642 and current liabilities were $4,306,739, leaving net working capital at $4,906,903.

Car Order Postponed

Washington, May 27.—The assigned car order of June 13, 1923, which has been postponed numerous times by the interstate commerce commission and which was to have become effective June 1, again has been postponed, to Aug. 1, the commission announces. This order was to limit the use of privately owned railroad cars in times of car shortage and would assign them among coal mines in case of emergency, regardless of ownership. The order was protested by iron and steel companies.

Bethlehem Action Quashed

A motion to quash a subpoena served on the Bethlehem Steel Co. in a suit instituted by minority stockholders of the Cambria Steel Co, to have the merger of the two concerns declared void, has been granted in New York by Federal Judge Learned Hand. This dismisses the action. The complainants were Edward B. Graves, Walter G. Graves, Arthur C. Graves and A. Margery Graves as executrix of the estate of Richard S. Graves, and William A. Paine.

Obituaries

WILLIAM JAMES BALDWIN, head of the Baldwin Construction Co., New York, died May 7 in Brooklyn, N. Y., aged 82 years. Mr. Baldwin was known internationally as an authority on steam and construction engineering and during the Civil war he gained considerable fame in the construction of three monitors and the conversion of several blockade runners into United States cruisers. He had been consulting engineer and designer for the United States War college in Washington, the United States immigration station in New York harbor and consulting engineer of the department of health, New York. He also for 24 years was consulting engineer for the New York Telephone Co. and the Empire City Subway Co., and lecturer and professor of thermal engineering at the Polytechnic institute, Brooklyn.

* * *

William T. Burt, aged 37, comptroller of the Wheeling Steel Corp., Wheeling, W. Va., was killed in an automobile accident near Washington, Pa., May 22.

* * *

William D. Miller, who had been connected with the Lewis Foundry & Machine Co., Pittsburgh, for a number of years as roll advisor and salesman, died May 13 of pneumonia.

* * *

George Edward Long, formerly vice president, manager and a director of the Joseph Dixon Crucible Co., Jersey City, N. J., died May 21 at Ridgewood, N. J. Mr. Long was 74 years of age. He entered the Dixon company's employe as a messenger boy in 1878 and retired as vice president in 1920.

* * *

C. B. Campbell, 50 years of age, secretary of the California Hardware Co., Los Angeles, died May 5 of heart disease. Mr. Campbell came to Los Angeles from Chicago 20 years ago and was connected with the California Hardware Co. for many years.

* * *

Henry Kauffman, for 12 years associated with the Hofius Steel & Equipment Co., Seattle, in an executive position, died at his home in that city April 30. He was a native of Pennsylvania and a member of the Seattle Engineers' club.

* * *

Ernest Johnson, assistant to the district sales agent at New York, of the Jones & Laughlin Steel Corp., Pittsburgh, died May 23 following an operation. Mr. Johnson was 46 years old and had been with the Jones & Laughlin corporation in New York for 26 years.

* * *

Edward F. Terry, organizer of Terry & Tench Co., contracting engineer, died May 13 of heart disease at Riverside, N. Y., aged 67 years. He was born at Concord, N. H., and was identified with many important construction projects throughout the country, including the Manhattan bridge, Grand Central terminal and the New York subway, all in New York and five bridges across the Mississippi river. During the war he organized the Terry Shipbuilding Co. at Savannah, Ga.

Machine Tool Buyers Hesitate

Many Large Lists for Equipment Before Manufacturers and Dealers but Closing Action Continually Is Postponed—Used Machinery Demand Gains Strength as Buyers Seek Price Concessions—Crane Inquiries Dwindle

DULLNESS in the machine tool market was more pronounced last week, with few developments of major importance appearing. In few districts is business holding to the levels indicated at the first of the month.

Industrial buying continues to be closed in driblets of one and two machines. Westinghouse Electric & Mfg. Co. was not active. Boards of education in Chicago and Pittsburgh are buying for vocational departments of schools.

Many railroad lists are before the market, but few show indication of immediate action. The Southern railroad has come into the market for an additional 18 machines for its Birmingham shops. The Union Pacific has placed about 40 tools, most of which went to Manning, Maxwell & Moore. The Burlington and Santa Fe are expected to act shortly on their lists. The Southern Pacific may be in the market soon for equipment for a car repair plant at Houston, Tex.

Used equipment is receiving an impetus from buyers' tendencies to save money. Prices concessions are frequent and are stimulating used tool sales. A general slump in volume of sales was evident last week as well as in new equipment.

Crane manufacturers are not booking much business and in order to get business several builders are reported to have revised their price lists. Used equipment is cutting into the new crane field.

Pending Railroad Lists Aggregate Large Total

NEW YORK, May 27.—Featuring an otherwise dull equipment market is an inquiry from the Southern railroad for 18 additional machines for its shops at Birmingham, Ala. The list includes three 16-inch belt driven lathes, two 16-inch bolt lathes, one 24-inch heavy duty lathe, one No. 4 universal milling machine, one 48-inch vertical milling machine, one keyway miller, one 12-inch slotter, one 6-inch, double spindle centering machine, one 16-inch die sinking machine, one 20-inch tool room drill press, one power hack saw, one nut facing machine, one heavy boring machine, one internal grinder and one 2500-pound steam hammer.

Formal orders against the Southern railroad's former list continue to come through, with one eastern seller receiving a contract for two planers, two boring mills, three steam hammers and one lathe. Other railroad orders include one used axle lathe for the Erie and one 2500-pound hammer for the New York Central. Industrial demand includes an inquiry for eight miscellaneous machines for the West Philadelphia plant of the General Electric Co., and orders for a few additional machines for its plant at Schenectady, N. Y.

Crane business continues restricted, with five locomotive cranes for the Chesapeake & Ohio and four locomotive cranes for shipment to Japan among the outstanding awards.

Foundry equipment buying in the eastern district is the lightest this year, according to leading sellers. With few exceptions current orders do not include more than one or two items, and in virtually all cases buying is for replacement purposes. At the moment there are few new foundry projects under contemplation, and this, in conjunction with the slowing up in business generally, promises little in the way of a revival in the immediate future.

Notwithstanding the slowing up in business, prices on the various lines of equipment are holding fairly steady at levels which have prevailed throughout the greater part of the past five months. This steadiness applies particularly to molding machines and sand cutters. Sellers of this latter equipment assert that there is quite a little buying by the pipe foundries who are operating at the highest rate of any class of foundries. A fairly good demand prevails for flasks and other supplies.

Dullness More Evident

CLEVELAND, May 27.—Dullness in the machine tool and equipment market last week was more in evidence, some dealers stating that fewer sales were made than in any similar period this year. Used tools are moving in better volume than new machines, although a considerable letup in used buying was noted last week. One dealer sold several new tools, but all were small. Few orders for large machines are to be found.

One of the largest lists out in this territory is that of the General Electric Co. for its service station in Detroit. Bids went in on 25 tools for this company last week to the general offices at Schenectady. Included in the inquiry were radial drills, shapers, lathes, etc. The Great Western Mfg. Co., Leavenworth, Kans., which is buying a large list for re-equipping its plant recently damaged by fire, probably will buy some used tools.

A Cleveland manufacturer again booked several orders from the Westinghouse Electric & Mfg. Co. The New York Central has added another tool to its long list. It is expected that the Southern Pacific will be in the market shortly for a large list to equip its $500,000 plant to be constructed at Houston, Tex.

Used equipment also is cutting in on the crane market, manufacturers reporting a tendency on buyers to take used cranes instead of new. It is reported that one manufacturer has revised his prices downward to meet this situation. The market is dull, with fewer inquiries coming out last week than in any similar period since the first of the year.

Inquiry Shows Improvement

BOSTON, May 27.—Leading machine tool dealers found conditions somewhat better last week. Inquiry which has shown slight improvement since the first of the month is resulting in a few scattered sales. Total transactions still are far from favorable and pronounced activity is not looked for in the near future, but a potential demand for production equipment undoubtedly exists. Recent sales have been almost entirely limited to individual tools. A Boston specialty manufacturer bought a press and a lathe. A paper mill bought a lathe and a grinder. Individual tools were taken by hardware

manufacturers, a textile mill and several general machine shops. From 20 to 30 tools of standard make are offered at auction sales at the plant of D. Goff & Sons Inc., Pawtucket, R. I.

Inquiry for several cranes has been before the trade for a month or more without action.

Machinery Buying Delayed

PITTSBURGH, May 27.—Each week new inquiries develop in connection with machine tools and other equipment but for the most part manufacturers are postponing expenditures for such purposes. Buying is confined to single tools or two or three items at a time. Some machinery dealers report that no sales were made at all last week although plenty of proposals were filed on inquiries. Some of the inquiries current are for the purpose only of checking prices on new machines against quotations received on used machinery to see whether the saving involved is worth while. One interesting inquiry comes from an automobile manufacturer located, or about to locate, on the Pacific coast; this involves 25 or 30 items. Another smaller list is out from the Universal Portland Cement Co. for 8 or 10 items, including a boring mill, lathe, milling machine, 36-inch planer and some small items amounting in all to about $25,000. Bids are in today on the Braddock high school list referred to last week. Action has not as yet been taken on the Peabody high school equipment list and the order probably will be distributed among several sellers. One dealer sold a $500 lathe to another dealer in Martinsburg, W. Va., and disposed of a 20-inch motor-driven lathe, a drill press and several grinders to different users. Action on various large crane and machine tool lists still is deferred, including the Carnegie Steel Co., Westinghouse Electric & Mfg. Co., Westinghouse Airbrake Co., and the Gary Tube Works. The American Sheet & Tin Plate Co .is scheduled to buy a 50-ton crane for its plant at Wellsville, O. Several other single crane inquiries are pending.

In foundry equipment, the market in large part is dull although here and there needed machinery and small supplies are bought to serve pressing needs, such as riddles, flasks, molding machines, etc. Recent purchasers of the latter type of equuipment include the Epping-Carpenter Co., the American Radiator Co., Buffalo; the General Electric Co., Lynn, Mass.; Duquesne Steel Foundry Co., Coraopolis, Pa.; Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.; Damascus Crucible Steel Castings Co., New Brighton, Pa.; Tennessee Coal Iron & Railroad Co., Birmingham; Sutton, Steele & Steele, Inc., Dallas, Tex., and the Eagle-Picher Lead Co., Hillsboro, Ill.

Early May Spurt Gone

CHICAGO, May 27.—Machinery dealers in this district felt encouraged by the volume of business taken in the first half of May but the last half apparently is falling down. Only the railroads now are displaying an inclination to buy. The Union Pacific railroad has placed approximately 40 tools, which nearly three quarters are understood to have been taken by Manning, Maxwell & Moore. The latter's order included six engine lathes, ranging from 18 to 36 inches, and several shapers. The interstate Machinery & Supply Co., Omaha, was awarded a bar cutter and Neff, Kohlbush & Kissel, Chicago, a punch and shear. The Union Pacific list included mostly roundhouse equipment. This week is expected to see both the Santa Fe and Burlington railroads acting on their lists. The board of education of Chicago is taking bids on one portable hollow chisel mortiser for the South Chicago continuation school and on one 20-inch band saw, one manual training lathe with motor underdrive and one smallest manual training shop size 3-wheel grinder on stand equipped with motor, for the Moreland continuation school.

Market Shows Improvement

CINCINNATI, May 27.—The tone of the market for machine tools and shop equipment continues to show slight improvement. Sales last week, while still confined to orders of one or two tools, increased in volume. A greater number of inquiries are being brought out from time to time from manufacturing industries. The automobile and woodworking industries are furnishing the greater part of the present demand. During the past week a Louisville manufacturer took three lathes and a Cincinnati manufacturer a lathe, grinder and milling machine. Buying on the part of the railroads has been reduced to a minimum. A number of the railroad companies in this district have laid off shopmen or have reduced the working week of the shop forces to a five day basis, owing to the general falling off in business.

Used equipment buying is the feature of the machinery market. Many manufacturers are turning to this class of equipment to gain the price concessions being offered. A majority of the machine tool plants in this district are operating from 40 to 60 per cent of their capacity. Unemployment is not as pronounced here as it is in many other centers.

Crane Awards and Inquiries of the Week

Orders Placed

Five 25-ton locomotive cranes for the Chesapeake & Ohio railroad to unnamed builder; the fourth ditcher included in the original list will not be purchased; the other three ditchers, as noted in last week's issue, went to the American Hoist & Derrick Co.

Four locomotive cranes for reconstruction work in Japan have been placed through Kongo Shokwai, 60 Beaver street, New York, to Industrial Works; two, each of 20 tons capacity, are for use by the railways; and the other two, one of 20 tons capacity and the other of 25 to 30 tons, for use by the reconstruction bureau.

Single Orders

20-ton overhead electric crane for the Charleston, S. C., navy yard, to the A. D. Granger Co., 15 Park Row, New York, noted in a recent issue as low bidder; the bid was $8945, which includes delivery, the services of an erection superintendent and wire and fixtures for a runway, 192 feet long.

15-ton locomotive crane for an industrial plant, to the Ohio Locomotive Crane Co.

20-ton crane for a contractor, to Ohio Locomotive Crane Co.

20-ton locomotive crane for Carnegie Steel Co., Homestead works, to the Browning Co., through the Factory Products Co., Pittsburgh.

2-ton single I-beam crane, 22-foot span, for the Dilts Machine Works, Fulton, N. Y., to the American Hoist & Derrick Co.

1-ton handpower crane awarded to the Curtis Mfg. Co., St. Louis, by Frank Robinson, Inc., Pittsburgh.

25-ton crane for a coal company in Chicago, to McMyler-Interstate Co.

22-ton crane for a stone company in St. Louis, to McMyler-Interstate Co.

Orders Pending

Two small cranes and electric hoist for Muth Bros., 207 East Capital street, Columbus, O.; pending.

20-ton double trolley handpower crane, 27-foot, 6-inch span, for export to Porto Rico; specifications issued through the Rojo-Fabian Co., 370 Broadway, New York.

15-ton overhead crane for R. D. Nuttall Co., Harrison avenue, Pittsburgh; pending.

One overhead crane, for American Roll & Machine Co., Warren, O.; pending.

Overhead crane for Hupp Motor Car Co., 3501 East Milwaukee street, Detroit; pending.

15 to 20-ton locomotive crane, used, with 35 to 40-foot boom, by North Carolina Granite Corp., Mt. Airy, N. C.; pending.

Several cranes for the Carnegie Steel Co., Homestead, Pa.; machine shop cranes to be purchased first—possibly this week.

Four 15-ton and one each 75, 50 and 35-ton cranes for the Westinghouse Electric & Mfg. Co., Sharon, Pa.; orders to be divided soon between three or four builders.

Five hoists and five cranes, 3-ton to 5-ton capacity, for the Westinghouse Airbrake Co., Wilmerding, Pa.; bids being filed—action expected soon.

5-ton crane for the American Sheet & Tin Plate Co., Wellsville, O.; bids all in.

5-ton crane for the Pittsburgh Steel Co., Pittsburgh; bids all in.

Recent Industrial Business Changes

BALL bearings formerly manufactured by the United States Ball Bearing Mfg. Co., 4527-67 Palmer street, Chicago, now are being produced by the Strom Ball Bearing Mfg. Co., the name of the former company recently having been changed.

* * *

Wetzel Wire & Iron Works, Inc., Chicago, has changed its name to the Wetzel Iron Works.

* * *

Pittsburgh Steel Co., Pittsburgh, now has its Chicago office in the Straus building, 310 South Michigan avenue.

* * *

The Big Sandy Iron & Steel Co., Jefferson county, Ala., has changed its name to the Big Sandy Coal & Iron Co.

* * *

National Engineering Co., 549 West Washington boulevard, Chicago, manufacturer of sand mixers and other foundry equipment, has appointed B. N. Schreuder as eastern sales representative, with offices at 50 Church street, New York.

* * *

The Chicago offices of Hickman, Williams & Co. have been moved from 1701 to 1214 McCormick building, 332 South Michigan ave.

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The Armco International Corp., affiliated with the American Rolling Mill Co., Middletown, O., has opened offices at Pinners Hall, Old Broad street, London, E. C. 2.

* * *

Federal Cement Tile Co., Chicago, has changed its address from Westminster building, to 608 South Dearborn street, occupying suite 1530 in its new location.

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The Rockingham Foundry Co. has taken over the plant of the former Portsmouth Foundry Co., Portsmouth, N. H. and will operate it as a jobbing foundry.

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L. D. Rockwell Co., Cleveland sales agent for the Mansfield Sheet & Tin Plate Co., Mansfield, O., has moved from 1512 B. F. Keith building, to 2002 Union Trust building. The Mansfield company has discontinued its office at 401 Continental Trust building, Washington, which had been in charge of Herbert P. Hill.

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Ward T. Huston of Ward Huston & Co., Chicago, has purchased the plant of the Ford Motor Co., at Wabash avenue, Pershing road and Fortieth street, that city, for use by the Peoples Gas Stores, Inc.

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J. D. Wilkins, Greensboro, N. C., distributor of contractors' supplies, machinery, etc., announces removal of his offices from Five Points to the building constructed at West Lee street and Glenwood avenue.

* * *

Coolee Engineering Co., Cleveland, manufacturer of electrical equipment, is to move to Sandusky O., where it will occupy the plant at Shelby and Water streets, owned by Weier Bros. Claude H. Cook is president of the company.

* * *

United Alloy Steel Corp., Canton, O., has changed the location of its Chicago office to the Straus building, Jackson and Michigan boulevards. The Chicago office is in charge of L. K. Townsend, district sales manager.

* * *

Mesabi Mineral association, has changed its offices from 108 Garfield street, North Hibbing, Minn., to 1009 Alworth building, Duluth, Minn. J. H. Poole is president and J. B. Cavanaugh, executive officer, of the association.

* * *

The Cleaton Co., Ltd., eastern Canadian representative of the Conveyors Corp. of America, Chicago, manufacturer of coal and ash handling equipment, has moved its offices to 1070 Bleury street, Montreal, Que. R. E. Cleaton is president and N. Bannatyne, chief engineer of the Cleaton organization.

* * *

The recent sale of mining, crushing, cement and creosoting machinery departments and equipment at Cudahy, Wis., of the Worthington Pump & Machinery Corp., New York, to Allis-Chalmers Mfg. Co., Milwaukee, will not mean disposition of the Worthington plant at Cudahy. Manufacture of gasoline engines will be continued at Cudahy on an enlarged scale. The Cudahy plant originally was that of the Power & Mining Machinery Co., absorbed by the Worthington interests about eight years ago.

* * *

The opening recently of an additional southern branch at 411 Lawyers building, Raleigh, N. C., is announced by C. A. Nash & Son, Inc., the branch serving the Carolina territory, and handling a complete line of builders' hardware, etc. H. G. Roselle, formerly with the Yale & Towne Mfg. Co., is in charge of the new branch.

* * *

Invincible Blow Pipe & Laundry Equipment Co., Chicago, has changed its name to the Invincible Laundry Equipment Co. and has increased its directors from seven to eight.

* * *

William Swindell & Bros., Pittsburgh, manufacturer of furnaces and gas producers, announced the removal of their general offices from 5035 Jenkins arcade building, to their new office building on Freeport road, near Aspinwall, Pa.

* * *

The George F. Wheelock Co. and the Phenix Supply Co., Birmingham, Ala., shortly will move into a new plant under construction on Avenue E, between Twenty-third and Twenty-fourth streets. The plant will be finished about June 1. The former company has been in the heating and metalworking business in Alabama about 25 years.

* * *

The Dunham Co., Chicago, manufacturer of heating systems, announces that it will move shortly into larger quarters from 2121½ First avenue, Birmingham. This branch serves the territory in Mississippi, Georgia, Alabama and Florida, and is in charge of C. P. Lichty.

New Construction and Enterprise

BESSEMER, ALA.—Harbison-Walker Refractories Co., Pittsburgh, is expected to start construction shortly on $300,000 plant to be established here. Plant will have daily capacity of 30,000 brick. J. F. Fletcher is here arranging details.

BIRMINGHAM, ALA.—The A. R. Robinson Machinery Co. has been formed by A. R. Robinson to deal in machinery, with headquarters at First avenue and Thirty-ninth street.

BIRMINGHAM, ALA.——The Southern States Saw & Machine Co. recently was incorporated for $25,000 to distribute machinery and equipment, by A. W. Hofsted, president; Edwin Hofsted, vice president; Earl Kean, secretary and John E. Magnuson, treasurer.

SHEFFIELD, ALA.—The Cherokee Rock Asphalt Co. plans developing rock asphalt deposits near here. Machine shops, etc., are to be constructed. Dr. Miller Reese Hutchinson is manager of the company.

CROCKETT, CAL.—The California-Hawaiian Sugar Co. is planning enlargements and improvements to include new structural steel buildings and wharves. Loading equipment, etc., probably will be needed. A. A. Brown, Matson building, San Francisco, is chief engineer.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

LOS ANGELES—California Truck Co., 322 East Third street, is constructing large warehouse and distribution terminal. A. Meyers is general manager.

LOS ANGELES—The Mack International Motor Truck Co., 1628 East Seventh street, plans constructing several buildings for storage and service purposes on Alameda street. J. M. Cooper, Marsh-Strong building, is architect.

MERCED, CAL.—The Merced Irrigation district, will open bids May 31 for constructing Exchequer dam and power house.

SAN PABLO, CAL.—The Pacific Sanitary Mfg. Co., manufacturer of sanitary ware, has acquired property adjoining its plant and is reported to be planning expansion.

VERNON, CAL.—Baash-Ross Tool Co., 108 West Second street, Los Angeles, has awarded construction contracts for plant here.

MERIDEN, CONN.—The M. & S. Mfg. Co. has been incorporated for $50,000 to build and deal in machinery, manufacture tools, etc., by Owen L. Seward and others.

STAMFORD, CONN.—H. E. Varran Co. has laid foundations for a manufacturing plant.

WATERBURY, CONN.—The Plume & Atwood Mfg. Co., 470 Bank street, manufacturer of brass, is taking bids on 5-story, 50 x 150-foot addition to its plant. *Noted April 3.*

WATERBURY, CONN.—The Waterbury Farrel Foundry & Machine Co., 425 Bank street, is planning construction of 60 x 100-foot addition to plant including charging department. F. A. Webster, 51 West Main street, is architect.

WINSTED, CONN—Strand & Sweet Mfg. Co. has taken bids for manufacturing plant here.

TAMPA, FLA.—The Tampa Shipbuilding &

Warehouse Steel Prices

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.49c to 3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	3.75c
New York	3.44c to 3.49c
Philadelphia	3.05c to 3.47c
Pittsburgh	3.15c
San Francisco	3.75c
Seattle	3.50c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.49c to 3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.49c
Philadelphia	3.05c to 3.47c
St. Louis	3.35c

REINFORCING BARS

Boston	2.75c to 2.90c
Chicago	2.45c
Cincinnati	3.40c to 3.50c
Cleveland	2.71c to 3.36c
Los Angeles, C. L.	3.60c
Los Angeles, L. C. L.	4.00c
New York	3.00c
Philadelphia	3.00c to 3.47c
Pittsburgh	2.40c to 2.50c
San Francisco, C. L.	3.65c
San Francisco L. C. L.	4.00c
Seattle	3.50c

SHAPES, STRUCTURAL

Boston	3.59c to 3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	3.85c
New York	3.54c to 3.59c
Philadelphia	3.05c to 3.57c
Pittsburgh	3.25c
San Francisco	3.60c
Seattle (large shapes)	3.60c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.59c to 3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	4.00c
New York	3.54c to 3.59c
Philadelphia	3.05c to 3.57c
Philadelphia, 3/16-inch	3.28c to 3.82c
Pittsburgh	3.25c
San Francisco	3.75c
Seattle	3.50c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.34c to 4.515c
Buffalo	4.30c
Chicago	4.00c
Cincinnati	4.10c
Cleveland	3.65c to 4.06c
Detroit	4.15c
Los Angeles	5.00c
New York	4.14c
Philadelphia	3.90c
San Francisco	5.00c
Seattle	4.75c
St. Louis	4.10c
St. Paul	4.25c

NO. 28 BLACK SHEETS

Boston	4.85c to 5.00c
Buffalo	5.00c
Chicago	4.70c
Cincinnati	4.80c
Cleveland	4.55c to 4.75c
Detroit	4.85c
Los Angeles	6.20c
New York	4.85c
Philadelphia	4.90c to 5.00c
San Francisco	5.80c
Seattle	5.75c
St. Louis	5.00c
St. Paul	4.95c

NO. 28 GALVANIZED SHEETS

Boston	5.85c to 6.00c
Buffalo	6.10c
Chicago	5.60c
Cincinnati	5.95c
Cleveland	5.60c to 5.80c
Detroit	6.00c
Los Angeles	7.00c
New York	5.85c
Philadelphia	5.90c to 6.00c
San Francisco	6.50c
Seattle	6.75c
St. Louis	6.00c
St. Paul	5.75c to 6.00c

BANDS

Boston	4.315c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.25c
Cleveland	4.16c
Detroit	4.10c
Los Angeles	4.65c
New York	4.09c
Philadelphia	4.00c to 4.27c
Pittsburgh	3.95c
San Francisco	4.50c
Seattle	4.50c
St. Paul	4.20c

HOOPS

Boston	5.19c to 5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.16c
Detroit	4.95c
New York	4.59c
Philadelphia, 1 inch and wider 20 gage and heavier	4.20c to 4.27c
Pittsburgh	3.95c
Seattle	5.50c
St. Paul	4.80c

COLD FINISHED STEEL

Boston (rounds)	4.35c
Boston (shapes)	4.85c
Buffalo (rounds)	4.45c
Buffalo (shapes)	4.95c
Chicago (rounds)	4.00c
Chicago (shapes)	4.50c
Cincinnati (rounds)	4.25c
Cincinnati (shapes)	4.75c
Cleveland (rounds)	4.10c
Cleveland (shapes)	4.60c
Detroit (rounds)	4.30c
Detroit (shapes)	4.80c
Los Angeles (rounds)	5.75c
New York (rounds)	4.40c
New York (shapes)	4.90c
Philadelphia (rounds)	4.15c to 4.35c
Philadelphia (shapes)	4.65c to 4.85c
Pittsburgh (rounds)	4.05c
Pittsburgh (sq. hex and flats)	4.55c
San Francisco (rounds)	5.50c
Seattle (rounds)	5.00c
St. Paul (rounds	4.25c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe

(Subject to Shading)

	Black	Galvanized
¼-⅜-inch butt	—31	+ 2
½-inch butt	—41	—24
¾-inch butt	—46	—32
1/3-inch butt	—48	—34
3½-inch lap	—44	—30
7-8-inch lap	—41	—11
9-10-inch lap	—35	— 8
11-12-inch lap	—34	— 6

Wrought Iron Pipe

	Black	Galvanized
¼-⅜-inch butt	+44	+78
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1-1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
3-6-inch lap	—11	+ 6
7-12-inch lap	— 3	+16

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

Engineering Co. plans constructing a branch plant at Tarrant City, Ala., for the manufacture of tractors, etc. Ernest Kreher is president.

TAMPA, FLA.—The Whiting Railway Motor Car Co., formed some time ago with $200,000 capital, plans constructing plant at Gary, Fla., near here, to manufacture railway motor cars.

COLUMBUS, GA.—Pekor Iron Works has started constructing machine shop and office building.

SAVANNAH, GA.—Hartfield-Garbut Machine Co. warehouses here recently were damaged by fire.

CHICAGO—Invincible Blow Pipe Co., 1822 North Lamon street, has been incorporated for $20,000 to manufacture and install blow pipes, dust collectors, sheet metal works, etc., by J. G. Ericksen, Daniel Bell and Otto Butzbach.

CHICAGO—Middle West Export Corp., 116 South Michigan avenue, has been incorporated for $20,000 to manufacture and deal in automobiles, motor trucks, cars and airplanes, by K. Hamilton, A. G. Savelli and F. C. West.

CHICAGO—Horine, Hoefer & Kalb Co., 534 North Michigan boulevard, has been incorporated for $6000 to manufacture and deal in machinery, by Felix Kalb, William H. Hoefer and Jules G. Horine.

CHICAGO—Gill Oil Burner Co., 744 South Michigan boulevard, has been incorporated for $25,000 to manufacture and deal in domestic and industrial heating apparatus, by John A. Castino, John Fleming and Robert G. Watts.

CHICAGO—American Locker Co., 209 South LaSalle street, has been incorporated for $1000 to manufacture and deal in metal lockers, cabinets, coin locks, etc., by E. A. Webber, Bertha B. Hayes and W. C. Hayes.

CHICAGO—The Ad-Lee Co., 825 South Wabash avenue, has been incorporated with $25,000 capital and 250 shares no par value stock, to manufacture advertising novelties, vending machines, etc., by Norman Felsenthal, J. W. Wertheimer and Adolph Felsenthal.

CHICAGO—United States Taximeter Co., 1124 West Jackson boulevard, has been incorporated for $1000 to manufacture and deal in taximeters, automobile accessories, etc., by Sydney J. Sabath, Joseph Weisinger and A. I. Weisinger.

CHICAGO—S. N. Nielsen Co., 3059 Augusta street, has been incorporated for $100,000 and 100 shares no par value stock, to manufacture and deal in building materials, machinery, tools, etc., by Johanna Margaret Nielsen, Elker R. Nielsen and Soren N. Nielsen.

CICERO, ILL.—Mechanical Signal Co., 5741-3 West Twenty-second street, has been incorporated for $25,000 to manufacture and deal in automobile parts, mechanical devices, etc., by Thomas J. Kerwin, Robert J. Eis and Gus Bernardo.

DECATUR, ILL.—Inter-State Fuel & Power Corp., 313 North Main street, has been incorporated with $500,000 to develop, mine and deal in bituminous coal, fuel, etc., by M. Harvell, S. O. Harvell and H. O. Hood.

GRANITE CITY, ILL.—National Lead Co. plans 3-story, 81 x 188-foot warehouse. George O. Carpenter, International Life building, St. Louis, is manager.

JOLIET, ILL.—Joliet Central Appliance Co., 305 North Ottawa street, has been incorporated for $10,000 to manufacture and deal in machinery, electrical appliances, etc., by Francis M. Maltby, George P. Peyla and Willis G. Maltby.

QUINCY, ILL.—Universal Sales Co., Stern building, has been incorporated for $50,000 to manufacture and deal in vending machines, etc., by Leo J. McGovern, Arthur C. Derrick and Leo C. Webster.

ROCKFORD, ILL.—The Rockford Brass Works has awarded contracts for constructing foundry and plant addition.

JEFFERSONVILLE, IND.—The Howard Ship Yard plans constructing 55 x 300-foot machine shop.

BATON ROUGE, LA.—Mengel Co., Louisville, Ky., manufacturer of automobile parts, wheels, etc., has purchased a 100-acre site from the Aluminum Ore Co. here and will start constructing plant shortly. H. B. Holtevert is manager.

BALTIMORE—The Carriage & Toy Co., 636-40 West Pratt street, has awarded contracts for reconstructing plant recently damaged by fire.

BALTIMORE—Robert S. Green, Frederick road and Caton avenue, plans 1-story, $40,000 warehouse. J. Raymond Gerwig, Forest avenue, Strathmore Park, is contractor.

BOSTON—J. C. Pushee & Sons are to build 5-story 65 x 133-foot plant and boiler house.

BOSTON—The Union Realty Co., 100 Cummington street, plans 2-story, 75 x 240-foot machine shop on Linden street.

LAWRENCE, MASS.—A 1 and 2-story, 125 x 150-foot machine shop is planned by the city. W. T. Rockefort is mayor.

WILLIMANSETT, MASS.—Lockwood, Greene & Co., Boston, engineers, are taking bids for 2-story concrete and steel manufacturing plant for B. F. Perkins & Son, Inc.

WORCESTER, MASS.—The Worcester Lawn Mower Co., Freemont street, has plans for constructing plant addition.

WORCESTER, MASS—The Dependable Machinery Co. has been incorporated for $200,000 by Albert W. Blackmer, Josephine M. Lindsay and Leone A. Bagley.

DETROIT—The Unique Brass Mfg. Co., 123 Military street, has awarded construction contracts for 1-story, 50 x 50-foot drop forge building.

DETROIT—The Hupp Motor Car Co., 3501 East Milwaukee street, has awarded construction contracts for 1-story, 50 x 150-foot steel block test building, including machine foundations, and a 1-story, 100 x 120-foot storage building, including overhead crane runways.

MILAN, MICH.—The American Boiler & Foundry Co. recently was incorporated with $50,000 capital and has plans for constructing foundry for production of iron castings. E. L. Watson is president and general manager.

DULUTH, MINN.—Minnesota Steel Co. is making additions to its merchant mill for manufacture of steel posts.

ST. LOUIS—Moon Motor Car Co., 4410 North Second street, will rebuild portion of plant recently damaged by fire.

BELLEVILLE, N. J.—Paramount Radiation Co. has been incorporated for $200,000 to make radiators, by James L. Moore.

IRVINGTON, N. J.—Electro-Mobile Corp., has been incorporated with $200,000 preferred stock and 3000 shares no par value common, to manufacture and deal in electrical machinery, by Stickel & Naughright.

KEARNY, N. J.—Work will be started at once by the Federal Shipbuilding Co., on rebuilding the portion of its plate shop recently damaged by fire. The damage lay mostly in the mold loft over the plate shop, and for that reason little heavy equipment in this department will have to be replaced. It is understood that the cranes can be continued in operation by the making of relatively small repairs.

NEWARK, N. J.—Precision Products Corp., has been incorporated for $150,000 to manufacture automobile parts and equipment and build automobiles, by William J. McFadden.

NEWARK, N. J.—Beach Electric Co., Inc., has been incorporated for $125,000 to manufacture electrical appliances, by Augustus L. Friedman.

BOLIVAR, N. Y.—McDonnell & Brannen Corp. has been incorporated with $350,000 capital to own and operate a machine and repair shop, by William J. Brannen, H. J. McIntyre and Walter Sherwood.

BROOKLYN, N. Y.—Harry Brainum, Inc., has been formed with $100,000 capital to manufacture sheet iron and steel and other products, by Harry Brainum Jr., 2661 Avenue M.; Barney Brainum, 510 Crown street, and M. A. Cutler, 1217 East Seventeenth street, Brooklyn.

BRONX, N. Y.—Fordham Metal Lath & Supply Co., has been incorporated to manufacture and deal in metal lath and building materials, by A. Magistro, N. Pomilla, V. Lacava, with F. Ciraolo, 51 Chambers street, New York, as attorney.

GREEN ISLAND, N. Y.—Plans are being prepared by the Ford Motor Co., Detroit, for the erection of a 2-story assembling plant, 130 x 1100 feet, which will serve as a unit at its new plant here, designed primarily for tractor production.

JAMESTOWN, N. Y.—Jamestown Sterling Corp. has been incorporated with 2800 shares $100 par preferred stock and 10,000 shares no par common, to design and install metal furniture, by Walter Beaty, 38 Prather avenue; George W. Jude, 301 East Eighth street, and A. E. Davis, 12 North Park Row, Erie, Pa.

LACKAWANNA, N. Y.—The Buffalo Brake Beam Co. will erect a plant here. The building is to be of brick and steel and will be used as a forge shop. The forge plant is part of extensive expansion prorgam under way by the company.

NEW YORK—Diamond & Frazer Iron Works has been incorporated for $10,000 by P. and S. Diamond and M. Frazer, with A. Gross, 261 Broadway, as attorney.

NEW YORK—Laskow Iron Works, has been incorporated for $10,000 by K. Laskowitz, J. and B. Elpren, with H. Rosenblatt, 220 Broadway, as attorney.

NEW YORK—Ambassador Sales Co. has been incorporated for $50,000 to build and deal in machinery, by L. Herold, M. A. Armond, with M. Schenckman, 56 Pine street, as attorney.

NEW YORK—Griffin Double Tread Wheel Co. has been incorporated for $250,000 to make iron and steel and their products, by L. F. Griffin, D. S. Merwin, H. F. Crosby, with The Company, 27 William street, as attorney.

NEW YORK—Pryko has been incorporated for $50,000 to manufacture and operate traps and valves, by R. W. Pryor Jr., W. S. Koithan, and C. C. Esterbrooks, with C. C. Beekman, 257 Broadway, as attorney.

NEW YORK—Feiner Auto Spring Co. has been incroporated for $6000 to manufacture and deal in automobile springs, by E. Feiner, I. Shneider and S. Brownfield, with B. A. Cohn, 302 Broadway, as attorney.

NEW YORK—Kleine Wefers Agency, has been incorporated with 100 shares no par value stock, to manufacture machine parts, by L. Freedman, M. Offenberger and T. A. Gledhon Jr., with H. S. Greenberg, 32 Broadway, as attorney.

NEW YORK—The J. G. White Engineering Corp., 43 Exchange Place, has been awarded a contract by the Staten Island Edison Corp., St. George, S. I., for the erection of two automatic power substations, at Livingston and Eltingville, S. I.

NEW YORK—Poole Mfg. Co. has been incorporated with 1000 shares $100 par preferred stock and 2000 shares no par value common, to manufacture clocks and mechanical devices, by A. H. Gleason, W. Levin and J. A. Carroll.

(*Continued on Page* 1464)

WABIK METAL

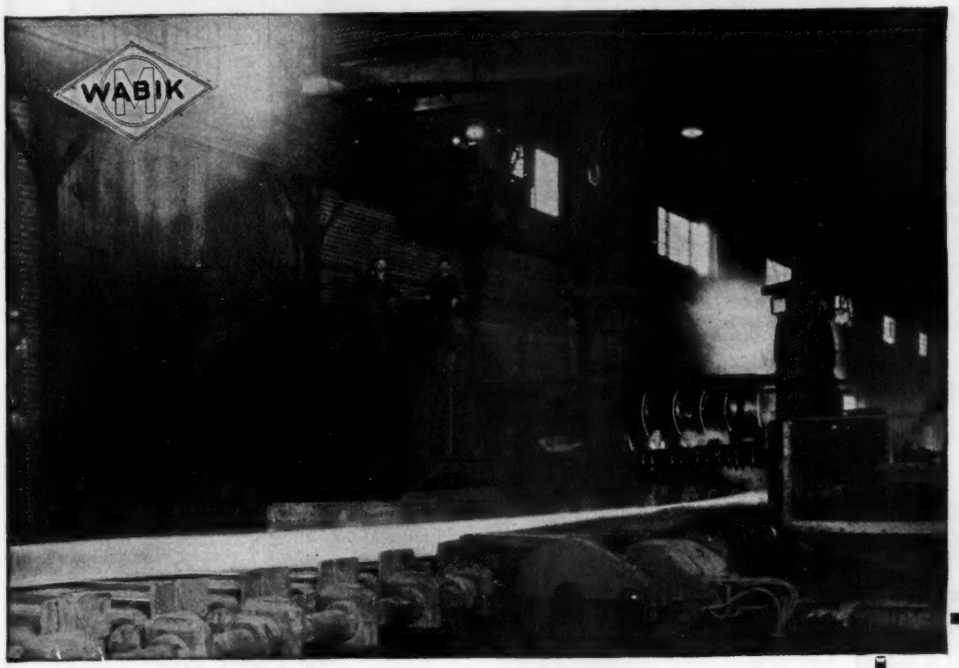


Illustration shows "Edging Pass" on 32" Breaking-down Mill. Our ingots are turned *four times* in this mill, breaking the scale each time and insuring a clean "bloom" for the 24" Sheet Bar Mill.

VITREOUS ENAMELING

STOVE DOOR PANELS: SPLASHER BACKS: BROILER PANS: TABLE TOPS: REFRIGERATORS: SIGNS: and other flat work.

WABIK METAL SHEETS, like all other "Mansfield" Products, are rolled from our own "Bottom-poured" Ingots.

They are very low in sulphur.

Other Specialties:

AUTOMOBILE SHEETS

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS

PICKLED and ANNEALED ENAMELING STOCK

For Kitchen Utensils

MILK CAN STOCK

ELECTRICAL SHEETS

"Mansfield" Steel is the ultimate in Sheet Bars and in Sheets. It means satisfaction to the many users. Constant study of the needs of users, and continuous application of the results of such study, in the way of improved methods in our plants has established a reputation for reliability unsurpassed.

SHEET BARS
INGOTS

MANSFIELD SHEET & TIN PLATE COMPANY

MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

The L. D. Rockwell Co., 1106 National City Bldg., New York, N. Y.
Mansfield Sheet & Tin Plate Co., 1372 Wrigley Bldg., Chicago, Ill.
Mansfield Sheet & Tin Plate Co., 12-237 General Motors Bldg., Detroit, Mich.
The L. D. Rockwell Co., 2002 Union Trust Bldg., Cleveland, O.
Wm. L. Hoffman, 1504 West Venango St., Philadelphia, Pa.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	13.50 to 14.00
Boston (dealers)	10.00 to 10.50
Buffalo	14.50 to 15.00
Chicago	14.00 to 14.50
Cleveland	13.50 to 13.75
Cincinnati	11.00 to 11.50
Detroit (dealers)	12.00 to 12.50
Eastern Pennsylvania	14.50 to 15.50
New York (dealers)	10.75 to 11.25
Pittsburgh	16.00 to 16.50
St. Louis	12.50 to 13.00
Valleys	15.75 to 16.00
No. 1 railroad steel New York (dealers)	10.75 to 11.25

COMPRESSED SHEETS

Buffalo	13.50 to 14.00
Chicago	11.00 to 11.50
Cleveland	11.25 to 11.75
Detroit (dealers)	10.00 to 10.50
Pittsburgh	13.50 to 14.00
Valley	13.50 to 14.00

BUNDLED SHEETS

Buffalo	8.50 to 9.00
Cincinnati	8.50 to 9.00
Cleveland	10.50 to 11.00
Detroit	9.00 to 9.50
Eastern Pennsylvania	11.50 to 12.00
Pittsburgh	12.50 to 13.00
St. Louis	8.00 to 8.50
Valleys	11.50 to 12.00

SHEET CLIPPINGS, LOOSE

Chicago	7.50 to 8.00
Detroit	7.00 to 7.50

STEEL RAILS, SHORT

Birmingham	14.00 to 15.00
Boston (dealers)	12.00 to 12.50
Chicago	17.00 to 17.50
Cincinnati	15.00 to 15.50
Cleveland (over 6 ft.)	12.75 to 13.00
St. Louis	15.50 to 16.00

STOVE PLATE

Birmingham	15.00 to 16.00
Boston (consumers)	15.00 to 15.50
Buffalo	15.00 to 15.50
Chicago	17.00 to 17.50
Cincinnati (net tons)	8.50 to 9.00
Cleveland	13.25 to 13.50
Detroit (net ton) dealers	12.00 to 12.50
Eastern Pennsylvania	14.00 to 14.50
New York (dealers)	11.00 to 11.50
Pittsburgh	13.00 to 13.50
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo	18.00 to 18.50
Cincinnati	13.00 to 13.50
Eastern Pennsylvania	18.00 to 19.00
Pitts. billet and bloom crops	20.00 to 20.50

SHOVELING STEEL

Chicago	13.75 to 14.25
Pittsburgh	12.50 to 13.00
St. Louis	12.50 to 13.00

KNUCKLES, COUPLERS, SPRINGS

Chicago	17.50 to 18.00
Eastern Pennsylvania	17.00 to 18.00
Pittsburgh	19.00 to 19.50
St. Louis	15.75 to 16.25

FROGS, SWITCHES, GUARDS

Chicago	14.00 to 14.50
Eastern Pennsylvania	14.00 to 15.50
St. Louis	13.00 to 13.50

BOILER PLATE, CUT

St. Louis	5.50 to 6.00

ANGLE BARS—STEEL

Chicago	16.25 to 16.75
St. Louis	13.50 to 14.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.50 to 12.00
Boston (dealers)	13.00 to 13.50
Buffalo	12.50 to 13.00
Cleveland, No. 1	11.00 to 11.50
Chicago, No. 1	13.50 to 14.00
Chicago, No. 2	14.00 to 14.50
Cincinnati, No. 1	10.00 to 10.50
Detroit, No .2	12.00 to 12.50
Eastern Pennsylvania	17.50 to 18.00
New York, No. 1 (dealers)	14.50 to 15.00
Pittsburgh, No. 1	13.00 to 13.50
Pittsburgh, No. 2	16.00 to 16.50
St. Louis No. 1	10.50 to 11.00
St. Louis, No. 2	11.50 to 12.00

WROUGHT PIPE

Boston (dealers)	9.00 to 9.50
Buffalo	11.00 to 12.00
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	9.75 to 10.25

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	16.00 to 17.00

CITY WROUGHT

New York, long	13.50 to 14.00

BUSHELING

Buffalo	13.50 to 14.00
Chicago, No. 1	11.50 to 12.00
Chicago, No. 2	8.25 to 8.75
Cincinnati, No. 1	9.00 to 9.50
Cleveland, No. 1	10.25 to 10.50
Cleveland, No. 2	8.75 to 9.25
Detroit, No. 1	10.00 to 10.50
Detroit, No. 2 (new)	9.50 to 10.00
Detroit, No. 2 (old)	8.50 to 9.00
Eastern Pennsylvania	14.00 to 15.00
Pittsburgh, No. 1	13.00 to 13.50
St. Louis, No. 1	11.50 to 12.00

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston (dealers)	6.50 to 7.00
Buffalo	10.50 to 11.00
Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Cleveland	11.25 to 11.50
Detroit (dealers)	8.00 to 8.50
Eastern Pennsylvania	11.50 to 12.00
New York (dealers)	8.00 to 8.50
Pittsburgh	12.00 to 12.50
St. Louis	5.50 to 6.00
Valleys	11.00 to 11.25

CAST IRON BORINGS

Birmingham (chemical	15.50 to 16.00
Birmingham (plain)	7.50 to 8.50
Boston (chemical)	8.00 to 9.00
Boston (dealers)	7.00 to 7.50
Buffalo	12.50 to 13.00
Chicago	10.00 to 10.50
Cincinnati	8.50 to 9.00
Cleveland	11.50 to 12.00
Detroit (dealers)	9.50 to 10.00
Eastern Pennsylvania (chem.)	14.00 to 14.50
Eastern Pennsylcania	12.00 to 12.50
New York (dealers)	8.25 to 8.75
Pittsburgh	12.50 to 13.00
St. Louis	8.25 to 8.75
Valleys	12.75 to 13.25

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	6.50 to 7.00
Cleveland	11.50 to 12.00
Detroit (dealers)	9.25 to 9.75
Eastern Pennsylvania	11.00 to 11.50
New York (dealers)	8.25 to 8.75

IRON AXLES

Birmingham	20.00 to 20.50
Boston (consumers)	31.00 to 32.00
Buffalo	25.00
Chicago	28.00 to 28.50
Cincinnati	18.00 to 18.50
St. Louis	26.00 to 26.50
New York (dealers)	20.00 to 21.00
Eastern Pennsylvania	20.00 to 22.00

IRON RAILS

Buffalo	19.00 to 20.00
Chicago	17.50 to 18.00
Cincinnati	10.50 to 11.00
St. Louis	10.50 to 11.00

PIPES AND FLUES

Chicago	9.50 to 10.00
Cincinnati	8.00 to 8.50
Cleveland	9.00 to 9.25
St. Louis	6.50 to 7.00

RAILROAD GRATE BARS

Buffalo	15.00 to 15.50
Chicago	16.00 to 16.50
Cleveland	13.25 to 13.50
Eastern Pennsylvania	14.00 to 14.50
New York (dealers)	13.00 to 13.50
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	8.00 to 8.50
Chicago	11.50 to 12.00
Cleveland (under 10 in.)	9.75 to 10.00
Cleveland (over 10 in.)	8.00 to 8.25
Detroit (dealers)	8.50 to 9.00

FORGE SCRAP

Boston (dealers)	7.50 to 8.00
Chicago	17.50 to 18.00
Eastern Pennsylvania	13.00 to 13.50

ARCH BARS AND TRANSOMS

Chicago	19.00 to 19.50
St. Louis	17.50 to 18.00

ANGLE BARS—IRON

Chicago	18.00 to 18.50
St. Louis	17.00 to 17.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	8.00 to 8.50
Buffalo	14.50 to 15.00
Chicago	11.50 to 12.00
Cleveland	11.50 to 12.00
Eastern Pennsylvania	13.50 to 14.00
Pittsburgh	14.50 to 15.00
St. Louis	9.00 to 9.50

STEEL CAR AXLES

Birmingham	17.00 to 18.00
Boston (consumers)	19.00 to 20.00
Buffalo	19.00 to 20.00
Chicago	18.50 to 19.00
Cleveland	17.75 to 18.25
Eastern Pennsylvania	17.00 to 19.00
Pittsburgh	19.00 to 19.50
St. Louis	16.25 to 16.75

SHAFTING

Boston (consumers)	19.00 to 20.00
Chicago	20.00 to 20.50
Eastern Pennsylvania	19.50 to 20.00
New York (dealers)	17.00 to 17.50
St. Louis	19.00 to 19.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	16.00 to 17.00
Birmingham, iron	15.00 to 16.00
Boston (consumers)	19.00 to 19.50
Buffalo	17.50 to 18.00
Chicago, iron	16.50 to 17.00
Cincinnati	10.50 to 11.00
Eeastern Pennsylvania	17.50 to 18.00
New York iron (dealers)	14.25 to 14.75
Pittsburgh, iron	16.50 to 17.00
Pittsburgh, steel	19.00 to 19.50
St. Louis, iron	14.00 to 14.50

NO. 1 CAST SCRAP

Birmingham, cupola	18.00 to 19.00
Boston (consumers)	20.50 to 21.00
Buffalo	16.50 to 17.50
Chicago, cupola	19.00 to 19.50
Cincinnati No. 1 machinery cupola (net tons)	15.50 to 16.00
Cleveland, cupola	19.00 to 19.50
Detroit (net tons) (dealers)	15.50 to 16.00
Eastern Pennsylvania, cupola	16.50 to 17.50
New York, cupola (dealers)	12.50 to 13.00
Pittsburgh, cupola	17.50 to 18.00
San Francisco	25.00 to 26.00
St. Louis, railroad	18.00 to 18.50
St. Louis, agricultural	18.00 to 18.50
Valleys	19.50 to 20.00

HEAVY CAST

Boston (consumers)	17.00 to 17.50
Buffalo (breakable)	15.00 to 15.50
Cleveland	12.00 to 12.25
Detroit (automobile) (net ton)	17.00 to 17.50
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	13.00 to 14.00
Pittsburgh	16.00 to 16.50

MALLEABLE

Boston (railroad)	16.50 to 17.00
Buffalo	19.00 to 19.50
Chicago, railroad	18.50 to 19.00
Chicago, agricultural	17.50 to 18.00
Cincinnati, agricultural	10.50 to 11.00
Cincinnati, railroad	15.00 to 15.50
Cleveland, agricultural	15.50 to 15.75
Cleveland, railroad	17.00 to 17.25
Detroit (dealers)	16.50 to 17.00
Eastern Pennsylvania, railroad	15.50 to 16.50
Pittsburgh, railroad	15.00 to 15.50
St. Louis, agricultural	14.50 to 15.00
St. Louis, railroad	14.75 to 15.25

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham, tram car	15.50 to 16.00
Boston (dealers)	14.00 to 14.50
Chicago	15.00 to 15.50
Cleveland	15.25 to 15.75
Detroit	11.50 to 12.00
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	14.00 to 14.50
Pittsburgh district	17.00 to 17.50
St. Louis	14.75 to 15.25

LOCOMOTIVE TIRES

Chicago	17.00 to 17.50
St. Louis	14.00 to 14.50

LOW PHOSPHORUS PUNCHINGS

Chicago	16.00 to 16.50
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	19.00 to 19.50

This is the plant of The Williamson Heater Company. Ferguson has built this same building for Procter & Gamble, General Electric, National Cash Register and scores of America's finest industrial concerns.

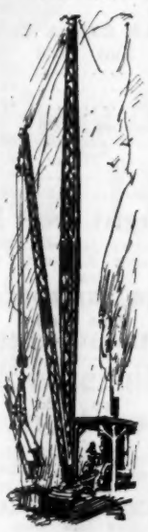
Buy This Building—Save 20 Per Cent—Occupy in Thirty Days

Here is a permanent rugged building of concrete, brick and steel. Ferguson has built it for scores of America's largest industrial companies.

Ferguson will turn it out for you in 30 working days. The design is proved by service. You can buy now for 20% less than February prices. And in three days after you give your order the steel, sash, glass, purlins and lumber will be shipped—from stock.

Advantages of this Building

1. **An average of over 2000 square feet of unobstructed floor space for every interior column.**
2. **More than usual amount of daylight. Sashes four lights high in monitor and additional light at top of side walls. White paint insures even diffusion of light over entire floor area.**
3. **Better ventilation insured by the "V" monitor, which acts as a deflecting surface for incoming air. Actual test shows these buildings 5° to 10° cooler in summer through this scientific distribution of air.**



4. **Better drainage provided by roof with three times more than usual roof pitch.**
5. **No drip over, from monitor or roof, as all drainage is inside the building, where down-spouts can't freeze.**
6. **Each truss is designed to carry a distributed load of monorails or shafting. Elevated toilets, locker rooms, heating pipes or ducts, may be carried on the trusses.**
7. **Architectural treatment of exterior may be made to harmonize with any existing plant.**

Ferguson Buildings are Guaranteed

Ferguson buildings are *guaranteed* in design, construction, cost and delivery date. Whether you need additional space immediately or are planning for future expansion, Ferguson engineers can help you. Get the Ferguson proposition before you start your plans. It will cost you nothing to learn why big industry builds the Ferguson way. Come, wire or telephone. Or write for booklet "F"

Cleveland Office: 4900 Euclid Bldg. Telephone, Randolph 6854

THE H. K. FERGUSON COMPANY

New York Office: 25 W. 43rd St. Telephone Vanderbilt 4526

Ferguson

GUARANTEED BUILDINGS

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron. $5.65
Mesabi bessemer, 55 per cent iron.... 5.40
Old Range nonbessemer, 51½ per cent iron 4.90
Mesabi nonbessemer, 51½ per cent iron 4.75

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent ..... 9.00 to 10.50
Copper free low phosphorus 53 to 65 per cent ..... 12.50 to 14.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 9.50
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 10.50
Swedish and Norwegian low phosphorus, 68 per cent.. 11.00 to 11.50
Swedish foundry or basic, 66 to 68 per cent ..... 9.00 to 10.00
Spanish foundry or basic, 50 to 54 per cent ..... 8.00 to 9.00
Alegerian foundry and basic, 50 to 54 per cent ..... 8.00 to 9.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent....nominal
Indian, minimum 47 per cent.....
....nominal 41 to 42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent.....
.....Ordinary, 43 cents c.i.f. tidewater
.....Washed, 46 cents c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton $19.00 to 23.50
Washed gravel, imported duty paid eastern tidewater, per gross ton ..... 20.60 to 21.10

Rivets

Structural rivets, C. L. Pitts.. 2.60c
Structural rivets L. C. L. Pittsburgh ..... 2.65c to 2.75c
Rivets, 7/16-in. and smaller.....
.....70 and 10 off

Nuts and Bolts

(Up to 1¾ and 1½ inches inclusive)

Hot pressed square or hexagon blank .....$5.00 to 4.75 off list
Hot pressed square or hexagon tapped .....$5.00 to 4.75 off list
Cold punched square or hexagon blank .....$4.50 to 4.25 off list
Cold punched square or hexagon.... .....$4.50 to 4.25 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger .....75 and 10 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller ....80, 10 and 5 off
Price f.o.b. Pittsburgh, packages of 50.

CARRIAGE BOLTS
(¾ x 6 inches, smaller and shorter)

Rolled thread .....60, 10 and 10 off
Cut thread .....60 and 10 off
Larger and longer .....60 and 10 off

MACHINE BOLTS
(¾ x 4 inches, hot pressed nuts)

Rolled thread .....60 10, 10 and 10 off
Cut thread .....60, 10 and 10 off
Larger and longer ....60, 10 and 10 off
(¾ x 4 inches cold punched nuts)
Cut thread .....50,10 and 10 off
Larger and longer.....50, 5 off
Lag screws .....65, 10 and 10 off
Plow bolts Nos. 1, 2 and 3 heads.. .....50 and 10 off
4 to 10 heads.....50-10 + 20 off
Flat and round head stove bolts..... .....80,10 and 5 off
Other stove bolts .....80, 10 and 5 off
Tap bolts .....30 off
Bolt ends with hot pressed nuts..... .....60, 10 and 10 off
Bolt ends with cold punched nuts.... .....50, 10 and 5 off
Blank bolts .....60, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)..... ....45, 10 and 5 off

Washers

Wrought .....$5.25 to $5.75 off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	49	32½
11 and 12-inch	47	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers' carloads

THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap Welded)
(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch .....38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch ..... +22
1¾-inch ..... +12
2 and 2¼-inch..... + 2
2½ to 3-inch 3
3¼ to 4½-inch..... 5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 43 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½ and 5-inch..... 29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch..... 35 off
4-inch ..... 39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING
Base Discounts

Carbon, 0.10 to 0.20 per cent..... 83 off
Carbon, 0.30 to 0.40 per cent..... 81 off
Carbon 0.40 to 0.50 per cent.....net price
Plus differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES
(Effective April 19, 1923)

Outside diameter	Net prices per foot f.o.b. Pittsburgh Gage	Price
2-inch	12-gage	15c
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅜-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

Hot Rolled Alloy Steels

Prices per pound, Pittsburgh

S. A. E. Series—	
2300 (3½ per cent nickel)...	5.00c
3100 (nickel chromium).....	4.00c
6100 (chrome vanadium)	4.75c
6100 (chrome vanadium spring)	4.50c
9250 (Silico manganese spring)	4.00c to 4.25c

A roller used in the caterpillar track of a gasoline powered paver. Cast in Sivyer Hi-Carbon Electric Steel.

Defeating Abrasive Wear with a Sivyer Hi-Carbon Casting

THIS casting is subjected to extreme abrasive and pounding wear, as a roller, in the caterpillar track of a power paver. Yet, it must be light, for it forms part of the unsprung weight of the track. Sivyer Hi-Carbon Steel gives this thin section piece the strength to resist the abusing wear it receives—with no sacrifice of lightness.

Send Blue Prints

The physical properties of Sivyer Hi-Carbon Electric Steel Castings when they leave the Sivyer foundry, are as follows:

Tensile strength	80,000 lbs.
Yield Point	45,000 lbs.
Elongation in 2"	18%
Reduction in Area	25%

These properties can be increased after machining by a heat treatment consisting of heating, quenching and drawing.

The complicated thin section roller, shown above, has proven satisfactory, because:

Sivyer Hi-Carbon Steel successfully meets the requirements for strength and resistance to wear.

The development of special molding methods, involving the use of dry sand cores, eliminates the cracks and strains of cooling shrinkage.

The high temperature and the free flowing metal of the Sivyer electric furnaces, makes possible the successful pouring of thin and varying sections.

Perhaps, we can solve similar castings problems for you. Send blue prints of the part with a statement of your difficulties. We will be glad to study the problems involved and to recommend possible solutions without obligation on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Construction and Enterprise

(Continued from Page 1458)

with Hastings & Gleason, 258 Broadway, as attorney.

NORTH TONAWANDA, N. Y.—An automobile body works will be built on Erie avenue this spring.

NORTH TONAWANDA, N. Y.—Macbeth Body Co., Inc., 211 Hurst building, Frank W. Buse, president, plans 1-story, $100,000 concrete and steel plant.

OGDENSBURG, N. Y.—Work will be started shortly by the Capolen Steel Co., on the erection of a $75,000 foundry, 85 x 352 feet.

ROTTERDAM, N. Y.—Schenectady Steel Construction Co., has been incorporated for $10,000 by J. R. Hess, L. H. Phelps, M. B. Hess, with J. C. Cooper, Schenectady, as attorney.

GREENSBORO, N. C.—No-Kol Automatic Heater Corp. has been incorporated for $100,000 by R. G. Sloan, F. L. Fry and others.

OXFORD, N. C.—The Oxford Mfg. Co., recently incorporated for $50,000, has started constructing plant for manufacture of metal automobile license tags. E. G. Hulsey is manager.

SPENCER, N. C.—Southern railway soon will begin constructing roundhouse, flue and babbitt and machine shops here.

COLUMBUS, O.—The Sun Mfg. Co., Lorain and McKinley streets, is interested in purchasing metalworking machinery. T. A. Morton is general manager.

COLUMBUS, O.—Twentieth Century Heating & Ventilating Co., 972 North High street, is in the market for metalworking equipment for an enlargement to its shop. J. R. Dunn is manager.

LIMA, O.—General foundry equipment for gray iron and semi-steel purposes will be purchased by the Ward Railway Equipment Co., J. T. Ward is president.

ST. MARYS, O.—T. A. White, clerk, board of education, takes bids June 9 on equipment for manual training shops and laboratory departments of new high school.

ZANESVILLE, O.—A. H. Hall will construct 73 x 74-foot garage and sales office. Workshops will be equipped with latest machinery.

TULSA, OKLA.—Monarch Sheet Metal Corp., has been incorporated for $25,000 by J. L. Childers, George W. Derrick and others.

TULSA, OKLA.—A plant for the manufacture of oil reamers is planned by Earl G. Hastings, George Shedden, and others, who are reported as organizing a $100,000 company for that purpose.

BETHLEHEM, PA.—The establishment of a plant for the manufacture of metal toys is contemplated by the Conestoga Corp., recently organized with a capital of $350,000.

COLWYN, PA.—Work will be started shortly by the Woolford Wood Tank Mfg. Co. on the erection of a power plant.

ERIE, PA.—The Erie Malleable Iron Co. has been issued a permit to construct additions.

ERIE, PA.—Parker White Metal Co. has been granted permit to construct a brick foundry building.

GROVE CITY, PA.—Pri-co Mfg. & Sales Co. is in the market for lathes, drill presses, bandsaws and woodworking machinery. E. B. Cook is manager. The company manufactures aluminum products and automobile accessories.

PHILADELPHIA—Bids were closed May 29 on a plant addition for the Moore Push Pin Co., Front and Berkeley streets. The Ballinger Co. is architect.

PHILADELPHIA—Strawbridge & Clothier, Eighth and Market streets, contemplate alterations to their machine shop. The Ballinger Co. is architect.

PHILADELPHIA—David P. Austin has awarded the general contract for the erection of a small machine shop at Hancock and Montgomery streets to Joseph T. Murphy, 1712 North Second street.

PHILADELPHIA—A $17,000 warehouse will be erected at Columbia & Wildey streets by Theodore C. Ulmer. The general contract has been placed with Albert Bell, 1532 East Berks street.

PHILADELPHIA—A $45,000 manufacturing building will be erected at Wheatsheaf and Coral street, by James Hultor Sr. F. Crompton & Bro., 4614 Oakland, have been awarded the general contract.

PHILADELPHIA—L. H. Gilmer Co., Stoneville and Cottman streets, Tacony, manufacturer of transmission belting, conveyors, etc., is disposing of a bond issue of $600,000, a portion of the proceeds to be used for expansion. L. H. Gilmer is president.

NEWPORT, R. I.—The Newport Oil Burner Co. has been incorporated with 5000 shares no par value stock, by William P. Sheffield, J. K. Sullivan, William A. Peckham, William A. Sherman and Frank P. Nolan.

PROVIDENCE, R. I.—The North Main Exide Battery Co. has been incorporated for $100,000 by Felix Meenagh, M. L. Boss and John T. Reilly, to manufacture batteries, etc.

GREENVILLE, S. C.—The Greenville Steel & Foundry Co. is in the market for riveting hammers, chippers, reamers, bolt machine, hoists, etc. E. R. Saunders is chief engineer.

DUCKTOWN, TENN.—The Ocoee Copper Co., copper mining company, is expected to raise production soon from 600 to 800 tons daily, and additional facilities and equipment will be provided.

CORPUS CHRISTI, TEX.—Pressed Metal Mfg. Co. is in the market for machinery and tools for pressing metal. M. W. Shelby is president. C. J. Jennings also is interested. *Noted March 27.*

DALLAS, TEX.—W. A. Browning Machinery Co. will erect warehouse and office on Exposition and Second avenues. Structure is to be 50 x 292 feet. Flint & Broad are architects.

POULTNEY, VT.—The Gray Foundry, Inc., with offices at 5 Nassau street, New York, is in the market for a ½-yard electric shovel.

CHARLESTON, W. VA.—The Metal Products Co., Boyd building, is in the market for a used combined punch and shear.

CHARLESTON, W. VA.—Cog City Machine Co. has been incorporated for $10,000 to manufacture and deal in machinery, by J. C. Leet, W. M. Ingram, W. H. Marquis, H. F. Marquis and Margaret Marquis.

ST. MARYS, W. VA.—Robert W. Russell, machinery dealer, is in the market for equipment for export, including drop press, hot swaging machine, bolt heading machines, alligator shear, scrap baling press, power hammers, air compressor, rotary shear, etc.

MILWAUKEE—John J. Frey and H. G. Peters, who operated the Liberty Tool & Machine Works at 467 Potter avenue for several years, are re-engaging in the tool and die business in the same plant. The business has now been incorporated at the Liberty Tool & Machine Co., with $20,000 capital.

MILWAUKEE—Pawling & Harnischfeger Co., builder of electric traveling cranes, machine tools, etc., is making extensive alterations and improvements to its foundry recently acquired from the Hercules Steel Casting Co. at 871 Robinson avenue. O. P. Wills is general plant engineer. Foundry is used for steel castings.

OSHKOSH, WIS.—Contracts have been let by the Oshkosh Corrugated Mfg. Co., for the erection of its new plant, 92 x 150 feet, 2-story. The company recently was incorporated for $100,000 by John Orlebeke and associates in the National Box & Specialty Co. of Sheboygan, Wis.

PHILLIPS, WIS.—A branch garage and repairshop, 50 x 100 feet, will be built here by Vincent & Vincent, conducting an extensive automobile business at Park Falls, Wis.

RACINE, WIS.—The Pioneer Iron & Coal Co. has been incorporated with $10,000 capital stock by Nathan Blumberg and Leonard P. Baumblatt to deal in scrap metals and coal.

TOMAH, WIS.—The Pittsburgh-Des Moines Steel Co. has been awarded the contract for an 80,000-gallon steel tank on a 100-foot tower for the extensive water works improvement now being made here. Contracts for pumps and other equipment remain to be let.

TWO RIVERS, WIS.—Becker Mfg. Co. soon will be in the market for furnaces, etc., for its proposed foundry to manufacture castings and machined parts. Frank Becker is president and Michael Becker is secretary and treasurer. *Noted May 1.*

WAUSAU, WIS.—A $50,000 factory addition will be erected by the Marathon Electric Mfg. Co., maker of small electrical tools, appliances and devices. The building will be 50 x 114 feet, and the construction work has been let to Theodore Kohl of Wausau. Austin Kimble is general manager.

Business in Canada

EDMONTON, ALB.—Forest Hooper Mfg. Co., Ltd., has been incorporated to manufacture and deal in iron and steel and other metals and their products, with $300,000 capital, by Forest Hooper Jr., Forest Hooper and William J. Wilson.

TORONTO, ONT.—Traffic Signal Corp., Ltd., has been incorporated with $50,000 capital to manufacture signal devices, machinery, etc., by John L. Grogan, William A. Murray and Frederick Lane.

TORONTO, ONT.—Kelvinator of Canada, Ltd., has been incorporated with $50,000 capital to manufacture electrical refrigerating machinery and refrigerators, by Alfred W. Graham, Thomas H. Wilson and Elizabeth Jennings.

TORONTO, ONT.—The Windeler Electric Co., Ltd., has been incorporated to manufacture and deal in electrical machinery, equipment, instruments, etc., with $40,000 capital by Alexander M. Garden, Hamilton J. Stuart, and John B. Aylesworth.

TORONTO, ONT.—The Wireless Dry Cells, Ltd., has been incorporated to manufacture dry cells, electric torches, heating appliances, lamps, etc., with $300,000 capital by George H. Sedgewick, Collamer C. Calvin and John W. Pickup.

TORONTO, ONT.—Visible Records Equipment Co., Ltd., has been incorporated to manufacture and deal in office equipment, filing cabinets, index equipment, furniture, etc., with $40,000 capital by Joseph M. Bullen, Harold L. Steele and Gerald Murphy.

WINDSOR, ONT.—The Studebaker Watch Co. of Canada, Ltd., has been incorporated to manufacture watches, clocks, time recorders, etc., with $100,000 capital by Newton M. Young, Fred H. Barlow and Henry C. Waind.

MONTREAL, QUE.—Radio Distributors, Ltd., has been incorporated with $200,000 capital to manufacture electrical equipment and carry on business as mechanical and electrical engineers, by Francis C. Dobell, Francis G. Bush and Herbert W. Jackson.